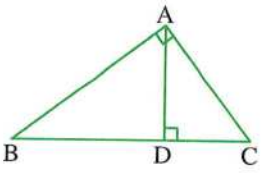
Model 1

Answer the following questions :

1 Complete the following :

1 In the opposite figure :



AB × ..... = BC × AD

2 In Δ ABC , if $(AC)^2 + (BC)^2 = (AB)^2$, then m (∠ .....) = 90°

3 If the point A ∈ the line L , then the projection of the point A on the line L is .....

4 The area of the circle of diameter length 14 cm. is ..... cm^2. $(\pi = \frac{22}{7})$

5 A trapezium whose bases lengths are 8 cm. , 10 cm. and its height is 5 cm. , then its area equals ..... $cm.^2$

---

2 Choose the correct answer :

1 In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then ∠ C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 A rhombus whose diagonals lengths are 6 cm. , 10 cm. has area ..... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

3 The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

4 If the area of a trapezium is 100 cm^2 and its height is 5 cm. , then the length of its middle base equals ..... cm.

(a) 20 (b) 30 (c) 40 (d) 50

5 ABCD is a parallellogram in which m (∠ A) = 70° , then m (∠ B) = ...°

(a) 70 (b) 110 (c) 180 (d) 360

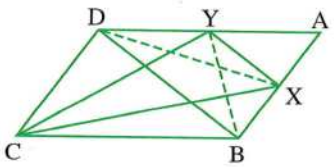
6 The measure of each angle of the regular pentagon is .....°

(a) 90 (b) 108 (c) 120 (d) 540

---

3 [a] The side lengths of one of two similar triangles are 3 cm. , 4 cm. , 5 cm. and the perimeter of the other triangle is 36 cm. Find the side lengths of the other triangle.

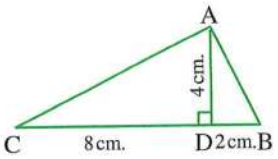
[b] In the opposite figure :



ABCD is a parallelogram , X ∈ $\overline{AB}$, Y ∈ $\overline{AD}$ such that : The area of Δ CBX = the area of Δ CYD

Prove that : $\overline{XY}$ // $\overline{BD}$

4 **[a] In the opposite figure :**



ABC is a triangle in which : BD = 2 cm. , CD = 8 cm. , AD = 4 cm. , $\overline{AD} \perp \overline{BC}$

Prove that : m ($\angle$ BAC) = 90°

[b] ABCD is a parallelogram in which : AB = 18 cm. and BC = 12 cm.

We draw $\overline{DE} \perp \overline{BC}$, $\overline{DO} \perp \overline{AB}$, DE = 15 cm.

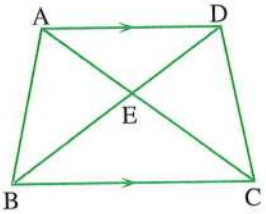
Calculate the area of the parallelogram ABCD and find the length of $\overline{DO}$

---

5 **[a]** ABC is a triangle in which m ($\angle$ A) = 50° , m ($\angle$ B) = 60° ,

Arrange the lengths of the sides of the triangle in a descending order.

[b] In the opposite figure :



ABCD is a quadrilateral in which

$\overline{AD} \parallel \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{E\}$

Prove that : The area of Δ ABE = the area of Δ DCE

Model 2

Answer the following questions :

1 **Complete the following :**

1. The two polygons are similar if their corresponding sides are ..... and their corresponding angles are .....
2. The area of a rhombus is 24 cm.^{2} , the length of one of its diagonals is 8 cm. , then the length of the other diagonal is .....
3. In Δ ABC , if $(AB)^2 = (AC)^2 - (BC)^2$, then Δ ABC is right-angled at .....
4. A triangle whose side lengths are 6 cm. , 8 cm. and 11 cm. , then its type according to its angles is .....
5. The area of a triangle is equal to half of the area of a parallelogram if they have a common .....

---

2 **Choose the correct answer :**

1. A trapezium whose bases lengths are 6 cm. , 8 cm. , then the length of its middle base equals ..... cm.

   (a) 48 (b) 24 (c) 14 (d) 7

2. If two polygons are similar and the ratio between the lengths of two corresponding sides is 1 : 3 and the perimeter of the smaller polygon is 15 cm. , then the perimeter of the greater polygon is ..... cm.

   (a) 30 (b) 45 (c) 60 (d) 75

3 If the area of the triangle is 24 cm.^{2} and its height is 8 cm. , then the length of the corresponding base is ..... cm.

(a) 16 (b) 6 (c) 3 (d) 12

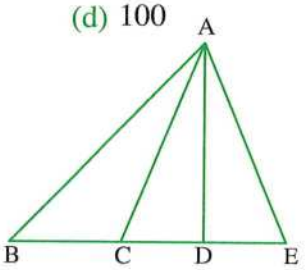
4 ABC is a right-angled triangle at B , $\overline{BD} \perp \overline{AC}$, then the projection of $\overline{BD}$ on $\overleftrightarrow{AC}$ is the point .....

(a) A (b) B (c) C (d) D

5 A square of perimeter 20 cm. , then its area equals ..... cm^2

(a) 20 (b) 25 (c) 50 (d) 100

6 The number of the triangles in the opposite figure equals .....



(a) 3 (b) 4

(c) 5 (d) 6

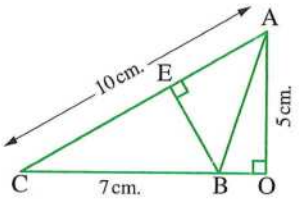
3 In the opposite figure :

$\overline{AO} \perp \overleftrightarrow{CB}$, $\overline{BE} \perp \overline{AC}$

, AC = 10 cm. , BC = 7 cm. and AO = 5 cm.

Find : 1 The length of $\overline{BE}$

2 The area of Δ ABC



4 [a] ABCD is a parallelogram in which : AB = 8 cm. , AC = 20 cm. and BD = 12 cm.

Prove that : m ($\angle$ ABD) = 90° , then find the area of this parallelogram.

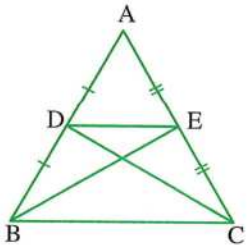
[b] In the opposite figure :

ABC is a triangle in which D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{AC}$

Prove that :

1 The area of the triangle DBC = the area of the triangle EBC

2 $\overline{DE} \,//\, \overline{BC}$

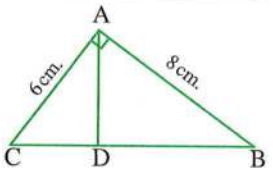


5 [a] In the opposite figure :

Δ DBA is similar to Δ ABC , m ($\angle$ BAC) = 90°

Prove that : $\overline{AD} \perp \overline{BC}$ and if AB = 8 cm. , AC = 6 cm.

, **find :** the length of $\overline{BD}$



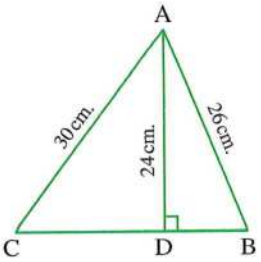
[b] In the opposite figure :

ABC is a triangle , $\overline{AD} \perp \overline{BC}$

If AD = 24 cm. , AB = 26 cm.

and AC = 30 cm.

, **find :** BC , then calculate the area of Δ ABC



Model for the merge students

Answer the following questions :

1 Choose the correct answer from those given :

1 The area of the parallelogram whose length of its base is 6 cm. and its corresponding height of this base is 4 cm. equals ..... cm^2

(a) 12 (b) 20 (c) 24 (d) 48

2 The triangle whose lengths of its sides are 6 cm. , 8 cm. , 10 cm. is .....

(a) an acute-angled triangle. (b) a right-angled triangle.

(c) an obtuse-angled triangle. (d) otherwise.

3 The rhombus whose lengths of its diagonals are 6 cm. and 10 cm. , then its area = ... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

4 The trapezium of length of its middle base 8 cm. and surface area 56 cm^2 , then its height = ... cm.

(a) 32 (b) 24 (c) 448 (d) 7

5 All ..... are similar.

(a) squares (b) triangles (c) rectangles (d) parallelograms

2 Complete each of the following :

1 The projection of a point on a straight line is .....

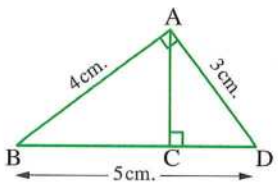
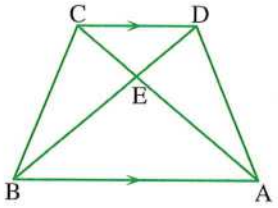
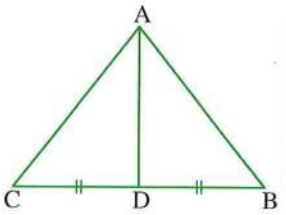
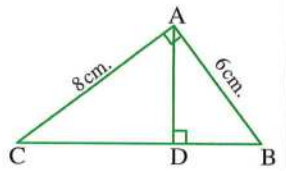
2 If the triangle ABC is obtuse-angled at B , then $(AC)^2$ ..... $(AB)^2 + (BC)^2$

3 The square whose length of its diagonal is 8 cm. , then its area = ... cm^2

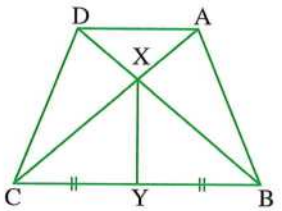
4 The two triangles have same base and the vertices opposite to this base are on a straight line parallel to the base .....

5 The area of triangle = $\frac{1}{2}$ × ..... × corresponding height.

3 **Join from the column (A) to the suitable one from the column (B) :**

Column (A)	Column (B)
1 **In the opposite figure :** AC = ... cm. 	• BEC
2 **In the opposite figure :** Area of Δ AED = area of Δ ..... 	• 2.4
3 **In the opposite figure :** Area of Δ ABD = area of Δ ..... 	• Congruent
4 If the ratio of enlargement between two similar triangles = 1 , then the two triangles are	• 3.6
5 **In the opposite figure :** The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ = ... cm. 	• ACD

4 **In the opposite figure :**



Area of the figure ABYX = Area of the figure DCYX

Complete the proof to prove that : $\overline{AD}$ // $\overline{BC}$

Given : .....

R.T.P. : .....

Proof : ∵ $\overline{XY}$ is a median in Δ XBC

$\therefore$ Area of Δ ..... = area Δ ..... (1)

$\because$ area of the figure ABYX = area of the figure DCYX (2)

By subtracting (1) from (2) :

$\therefore$ Area of Δ ..... = area of Δ .....

By adding area of Δ ADX to both sides

$\therefore$ Area of Δ ..... = area of Δ .....

$\therefore \overline{AD} // \overline{BC}$ (Q.E.D.)

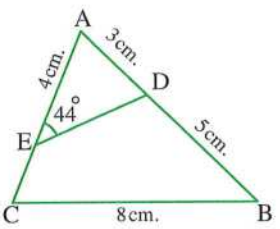
---

5 In the opposite figure :

$\Delta ABC \sim \Delta AED$

, m ($\angle$ AED) = 44° , AD = 3 cm. , EA = 4 cm.

, DB = 5 cm. , BC = 8 cm.



Complete to find the length of each of : $\overline{ED}$ and $\overline{EC}$

Solution :

$\because \Delta ABC \sim \Delta AED$

$\therefore \frac{AB}{.....} = \frac{.....}{ED} = \frac{CA}{DA}$

$\therefore \frac{8}{.....} = \frac{.....}{ED} = \frac{CA}{3}$

$\therefore$ ED = ... cm. , AC = ... cm. , EC = ... cm. (The req.)

2023

Some Schools Examinations on Geometry

1 Cairo Governorate

East Nasr City Educational Administration
Manarat Al Salem Language School

Answer the following questions :

1 Choose the correct answer :

1 The trapezium whose area is 30 cm.^{2} and its height is 5 cm. , then its middle base length is ..... cm.

(a) 6 (b) 30 (c) 150 (d) 3

2 If two polygons are similar and the ratio between the lengths of two corresponding sides is 3 : 5 , then the ratio between their perimeters is .....

(a) 5 : 3 (b) 3 : 5 (c) 1 : 2 (d) 1 : 3

3 The diagonals of an isosceles trapezium are .....

(a) congruent. (b) perpendicular.

(c) bisecting each other. (d) parallel.

4 ABC is a triangle , if $(AC)^2 > (AB)^2 + (BC)^2$, then $\angle B$ is .....

(a) obtuse. (b) acute. (c) right. (d) straight.

5 The length of the projection of a given line segment ..... the length of the original line segment.

(a) $\geq$ (b) $>$ (c) $\leq$ (d) $=$

2 Complete the following :

1 The median of a triangle divides it into two triangles ..... in area.

2 The measure of the exterior angle of an equilateral triangle is .....°

3 The base length of a parallelogram is 7 cm. and the corresponding height is 4 cm. , then its area equals ..... cm.^{2}

4 If the area of a square is 18 cm.^{2} , then the length of its diagonal is ..... cm.

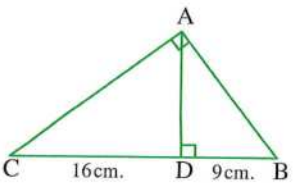
5 In a triangle , if the sum of the areas of two squares on two sides is equal to the area of the square on the third side , then the angle opposite to this side is .....

3 [a] In the opposite figure :

m ($\angle$ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , DC = 16 cm.

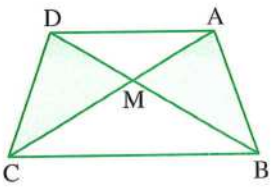
Find : The length of each of $\overline{AB}$, $\overline{AC}$, $\overline{AD}$



[b] In the opposite figure :

If the area of Δ AMB = the area of Δ CMD

, **prove that :** $\overline{AD} \parallel \overline{BC}$



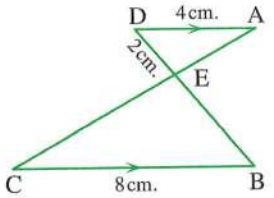
4 **[a] In the opposite figure :**

$\overline{AD} \parallel \overline{BC}$, AD = 4 cm.

, BC = 8 cm. , DE = 2 cm.

1 **Prove that :** Δ ADE ~ Δ CBE

2 **Find :** the length of $\overline{BE}$



[b] Identify the type of Δ BAC according to the measures of its angles where

AB = 7 cm. , BC = 9 cm. , AC = 12 cm.

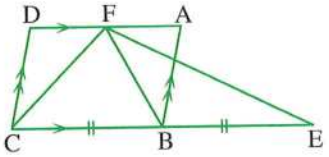
5 **[a] In the opposite figure :**

ABCD is a parallelogram

, $E \in \overrightarrow{CB}$, $F \in \overline{AD}$, CB = BE

Prove that :

The area of Δ FEC = The area of the parallelogram ABCD



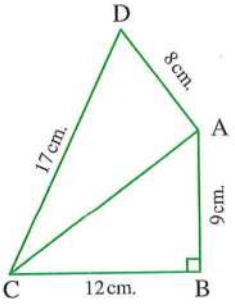
[b] In the opposite figure :

AB = 9 cm. , BC = 12 cm.

, AD = 8 cm. , DC = 17 cm.

, m (∠ B) = 90°

Prove that : m (∠ DAC) = 90°



2 Cairo Governorate

Cairo Education zone
Hadyek El-Maady O.L.S.

Answer the following questions :

1 **Choose the correct answer :**

1 A rhombus has diagonal lengths 6 cm. and 8 cm. , its area = ... cm^2

(a) 12 (b) 24 (c) 48 (d) 8

2 The triangle whose side lengths are 6 cm. , 8 cm. and 10 cm. is .....

(a) acute-angled. (b) right-angled. (c) obtuse-angled. (d) isosceles.

3 If two triangles are similar , then the corresponding sides are .....

(a) proportional. (b) equal. (c) congruent. (d) parallel.

4 The number of axes of symmetry of the equilateral triangle is .....

(a) 1 (b) 2 (c) 3 (d) 4

5 The triangle whose base length is 6 cm. and its corresponding height is 5 cm. , its area is ..... cm^2

(a) 30 (b) 12 (c) 15 (d) 6

2 Complete the following by the correct answers :

1 The median of the triangle divides it into two triangles ..... in area.

2 The area of the parallelogram = length of base × corresponding .....

3 A square is of side length 5 cm. , its area is ..... cm^2

4 The polygon ABCD is similar to the polygon XYZL , then m (∠ BCD) = m (∠ .....)

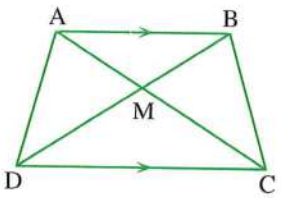
5 The sum of measures of the interior angles of a triangle equals .....°

3 [a] In the opposite figure :

$\overline{AB} // \overline{DC}$

Prove that :

The area of Δ BMC = the area of Δ AMD



[b] In the opposite figure :

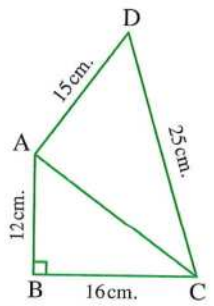
ABCD is a quadrilateral where m (∠ ABC) = 90°

, AB = 12 cm. , BC = 16 cm. , CD = 25 cm.

and AD = 15 cm.

1 **Find :** The length of $\overline{AC}$

2 **Prove that :** The triangle ADC is a right-angled triangle.



4 [a] Determine the type of the triangle ABC according to its angles where AB = 7 cm. , BC = 3 cm. and AC = 6 cm.

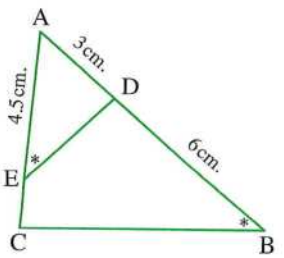
[b] In the opposite figure :

m (∠ AED) = m (∠ ABC)

, AD = 3 cm. , AE = 4.5 cm. , DB = 6 cm.

1 **Prove that :** Δ AED ~ Δ ABC

2 **Find :** The length of $\overline{EC}$

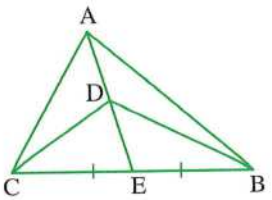


5 [a] A trapezium of lengths of two parallel bases 6 cm. and 4 cm. Find its area if its height is 5 cm.

[b] **In the opposite figure :**

$\overline{AE}$ is a median in the triangle ABC

Prove that : The area of Δ ABD = the area of Δ ACD



3 Giza Governorate — Mathematics Inspection

Answer the following questions :

1 Choose the correct answer :

1 If $\Delta ABC \sim \Delta DEF$, $m(\angle B) = 50°$, $m(\angle C) = 60°$, then $m(\angle D)$ = ...

(a) 70° (b) 90° (c) 110° (d) 180°

2 In ΔABC , if $(AC)^2 = (AB)^2 + (BC)^2$, then $\angle B$ is ..... angle.

(a) a right (b) an acute (c) an obtuse (d) a reflex

3 The ratio between the area of a triangle and the area of a parallelogram if they have a common base and included between two parallel straight lines equals .....

(a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

4 If the projection of a line segment on a straight line is a point , then the line segment is ..... to the straight line.

(a) $\in$ (b) $\equiv$ (c) $\perp$ (d) //

5 If two polygons are similar , then their corresponding angles are ..... in measure.

(a) equal (b) different (c) proportional (d) supplementary

2 Complete :

1 If ΔABC is right-angled at B , AB = 3 cm. , BC = 4 cm. , then AC = ... cm.

2 The base length in a parallelogram is 8 cm. and its corresponding height is 6 cm. , then its area equals ..... cm^2.

3 Two triangles which have the same base and their vertices opposite to this base lie on a straight line parallel to the base are .....

4 A square of diagonal length 10 cm. , then its area equals ..... cm^2.

5 A rhombus of diagonal lengths are 4 cm. and 6 cm. , then its area equals ..... cm^2.

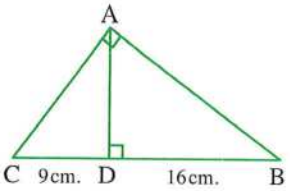
3 [a] Determine the type of the angle B in ΔABC in which AB = 6 cm. , BC = 8 cm. and AC = 10 cm.

[b] In the opposite figure :

m (∠ BAC) = m (∠ BDA) = 90°

, DB = 16 cm. , DC = 9 cm.

Find : the length of each of $\overline{AB}$ and $\overline{AD}$



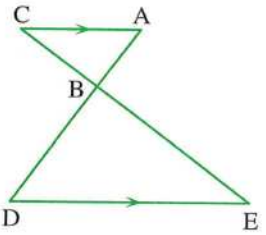
4 **[a]** Find the area of the trapezium whose lengths of its two parallel bases are 4 cm. and 6 cm. and its height is 3 cm.

[b] In the opposite figure :

$\overline{AC}$ // $\overline{ED}$

Prove that :

Δ ABC ~ Δ DBE



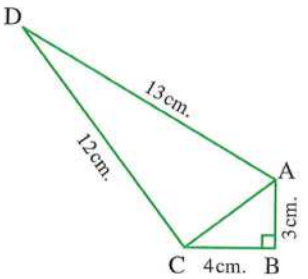
5 **[a] In the opposite figure :**

AB = 3 cm. , BC = 4 cm. , AD = 13 cm.

, CD = 12 cm. , m (∠ B) = 90°

1 **Find :** the length of $\overline{AC}$

2 **Prove that :** m (∠ ACD) = 90°



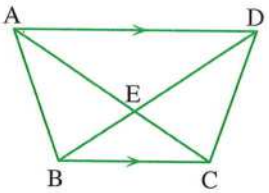
[b] In the opposite figure :

ABCD is a quadrilateral

in which $\overline{AD}$ // $\overline{BC}$

Prove that :

The area of Δ AEB = the area of Δ DEC



4 Giza Governorate

North Giza Educational Administration
El-Orman Language School

Answer the following questions :

1 **Choose the correct answer from those given :**

1 The area of the rhombus whose diagonal lengths are 6 cm. and 8 cm. equals ..... cm^2

(a) 7 (b) 24 (c) 48 (d) 14

2 ABCD is a parallelogram in which m (∠ A) = 120° , then m (∠ B) = ... °

(a) 120 (b) 60 (c) 90 (d) 180

3 If Δ ABC ≡ Δ XYZ and m (∠ X) = 70° , then m (∠ A) = ... °

(a) 70 (b) 55 (c) 50 (d) 80

4 If $\Delta ABC \sim \Delta XYZ$, then $m(\angle B) = m(\angle \ldots\ldots)$

(a) C (b) Z (c) X (d) Y

5 ABC is a triangle in which $(AB)^2 > (BC)^2 + (AC)^2$, then $\angle C$ is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 Complete :

1 The two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

2 If $\Delta ABC \sim \Delta XYZ$, $m(\angle A) + m(\angle B) = 60°$, then $m(\angle Z) = \ldots\ldots°$

3 If ΔABC is an obtuse-angled triangle at B , then $(AC)^2$ ..... $(AB)^2 + (BC)^2$

4 If the length of the diagonal of a square is 10 cm. , then its area is ..... cm^2

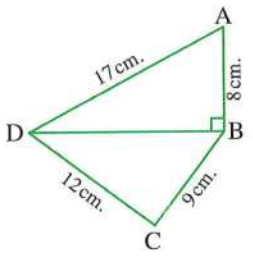
5 If the ratio between the lengths of two corresponding sides of two similar polygons is 2 : 5 and the perimeter of the smaller one is 12 cm. , then the perimeter of the other one is .....

3 [a] In the opposite figure :

ABCD is a quadrilateral in which :

AB = 8 cm. , BC = 9 cm.

, CD = 12 cm. , AD = 17 cm. and $\overline{DB} \perp \overline{AB}$



1 **Find :** the length of $\overline{BD}$

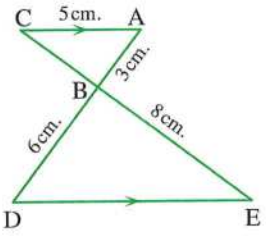
2 **Prove that :** $m(\angle C) = 90°$

[b] Identify the type of ΔABC according to the measures of its angles where AB = 5 cm. , BC = 6 cm. , AC = 7 cm.

4 [a] In the opposite figure :

$\overline{AC} // \overline{ED}$, $\overline{AD} \cap \overline{CE} = \{B\}$, AC = 5 cm.

, AB = 3 cm. , BD = 6 cm. , BE = 8 cm.



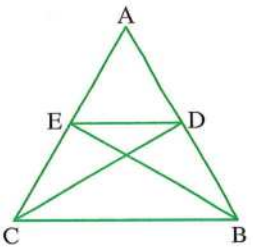
1 **Prove that :** $\Delta ABC \sim \Delta DBE$

2 **Find :** the perimeter of the triangle BED

[b] In the opposite figure :

If the area of ΔADC = the area of ΔAEB

, prove that : $\overline{DE} // \overline{BC}$



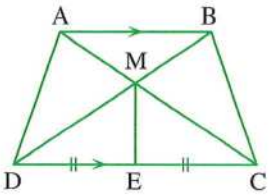
5 **[a] In the opposite figure :**

$\overline{AB} // \overline{DC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, E is the midpoint of $\overline{CD}$

Prove that :

the area of the figure ADEM = the area of the figure BCEM



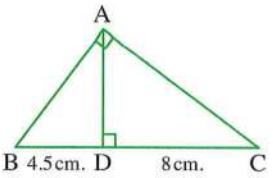
[b] In the opposite figure :

ABC is a triangle , m ($\angle$ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$, BD = 4.5 cm.

, DC = 8 cm.

Find : AD , AB , AC



5 Alexandria Governorate

Middle Educational Zone
Math Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 If $\overline{AB}$ is perpendicular to $\overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ .....

(a) = 0 (b) < AB (c) > AB (d) = AB

2 In Δ ABC , if $(AB)^2 < (BC)^2 + (AC)^2$, then $\angle$ C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

3 If Δ ABC $\sim \Delta$ DEO , 3 AB = DE , then BC = ... EO

(a) 2 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) 3

4 In Δ XYZ , if m ($\angle$ Y) = 90° , XY = 6 cm. , XZ = 10 cm. , then YZ = ... cm.

(a) 16 (b) 4 (c) 40 (d) 8

5 All ..... are similar.

(a) squares (b) triangles (c) rectangles (d) parallelograms

2 **Complete each of the following :**

1 The area of the triangle whose base length is 6 cm. and its corresponding height is 8 cm. equals ..... cm^2.

2 Two triangles are similar if the corresponding angles are .....

3 The area of the square whose side length is 4 cm. equals ..... cm^2.

4 A rectangle is a ..... with equal angles.

5 The area of the trapezium whose middle base is of length 7 cm. and its height is 6 cm. equals ..... cm^2.

3 [a] Determine the type of the angle X in the Δ XYZ in which
XY = 4 cm. , YZ = 7 cm. , XZ = 5 cm.

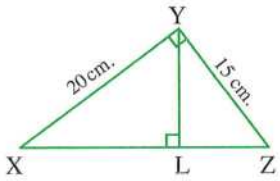
[b] Find the area of the parallelogram ABCD in which $\overline{AE} \perp \overline{BC}$ intersecting it at E , AE = 24 cm. , BC = 50 cm.

---

4 [a] **In the opposite figure :**

XYZ is a triangle in which $\overline{YL} \perp \overline{XZ}$, m ($\angle$ XYZ) = 90° , YZ = 15 cm. , XY = 20 cm.

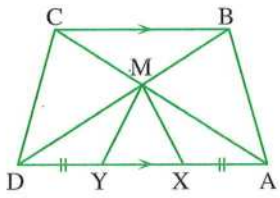
Find : The lengths of $\overline{XZ}$, $\overline{YL}$



[b] **In the opposite figure :**

If $\overline{AD} // \overline{BC}$, AX = DY , **prove that :**

the area of the figure ABMX = the area of the figure DCMY



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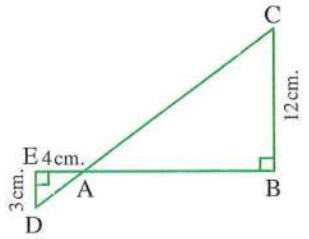
5 [a] **In the opposite figure :**

If $\overline{BE} \cap \overline{DC} = \{A\}$, m ($\angle$ E) = m ($\angle$ B) = 90° , AE = 4 cm. , ED = 3 cm. , BC = 12 cm. , **prove that :** Δ ABC ~ Δ AED , **then find :** the length of $\overline{BE}$



[b] Find the area of the rhombus whose diagonal lengths are 10 cm. , 8 cm.

6 El-Kalyoubia Governorate Math Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 The lengths of two adjacent sides of a parallelogram are 8 cm. and 5 cm. and the smaller height is 4 cm. , then its area equals ..... cm^2

(a) 17 (b) 32 (c) 20 (d) 52

2 The median of the triangle divides its surface into two triangles .....

(a) congruent. (b) equal in area.

(c) equal in perimeter. (d) similar.

3 The ratio between the lengths of two corresponding sides in two similar triangles is 3 : 5 , then the ratio between their perimeters equals .....

(a) 5 : 2 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

4 Δ ABC is a right-angled triangle at B , then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

(a) $\overline{AB}$ (b) $\overline{BC}$ (c) $\{B\}$ (d) 0

5 In Δ ABC if $(AC)^2 > (AB)^2 + (BC)^2$, then the type of $\angle$ A is .....

(a) right. (b) acute. (c) straight. (d) obtuse.

2 Complete each of the following :

1 The measure of the exterior angle of an equilateral triangle equals ..... °

2 The two triangles are similar if their side lengths are .....

3 A rhombus its diagonal lengths are 8 cm. , 6 cm. , then its area equals ..... cm^2

4 The two triangles drawn on a common base and their vertices are on a straight line parallel to the base are .....

5 If the ratio of enlargement between two similar polygons is 1 , then the two polygons are .....

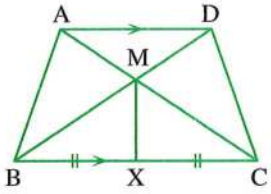
3 [a] The lengths of two parallel bases in a trapezium are 10 cm. and 8 cm. , and its height is 5 cm. Find the length of its middle base and its area.

[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$ and X is the midpoint of $\overline{BC}$

Prove that :

The area of the figure ABXM = the area of the figure DCXM

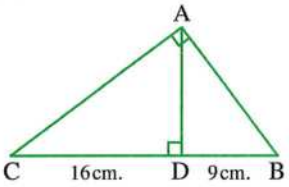


4 [a] In the opposite figure :

ABC is a right-angled triangle at A

, $\overline{AD} \perp \overline{BC}$, DB = 9 cm. , CD = 16 cm.

Find : The length of each of $\overline{AD}$, $\overline{AB}$, $\overline{AC}$



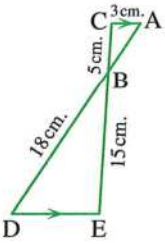
[b] In the opposite figure :

$\overline{AC}$ // $\overline{ED}$, AC = 3 cm. , BC = 5 cm.

, BD = 18 cm. , BE = 15 cm.

1 **Prove that :** Δ ABC ~ Δ DBE

2 **Find :** The length of each of $\overline{AB}$, $\overline{ED}$



5 [a] In the opposite figure :

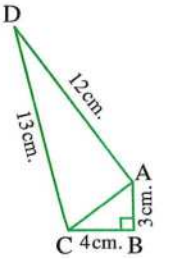
ABCD is a quadrilateral where m ($\angle$ ABC) = 90°

, AB = 3 cm. , BC = 4 cm.

, AD = 12 cm. , DC = 13 cm.

1 **Find :** The length of $\overline{AC}$

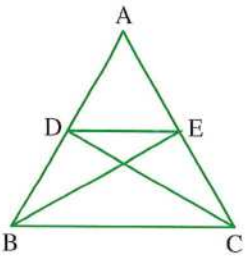
2 **Prove that :** m ($\angle$ DAC) = 90°



[b] In the opposite figure :

The area of Δ ABE = the area of Δ ACD

Prove that : $\overline{DE} \parallel \overline{BC}$



7 El-Sharkia Governorate

Directorate of Education
Omar Al-Farouk Governmental Language School

Answer the following questions :

1 Complete the following :

1. The area of a trapezium is 50 cm^2 and its middle base is of length 10 cm. , then its height equals ..... cm.
2. In Δ ABC , if $(AB)^2 = (AC)^2 + (BC)^2$, then ∠ ..... is right.
3. The area of a triangle = half × ..... × corresponding height.
4. If Δ ABC ~ Δ XYZ , then m (∠ A) = m (∠ .....)
5. The median of a triangle divides its surface into two triangles ..... in area.

2 Choose the correct answer :

1. All ..... are similar.

   (a) triangles (b) pentagons (c) squares (d) rectangles

2. If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

   (a) > (b) < (c) ≠ (d) =

3. The area of a parallelogram is 50 cm^2 and the length of its base is 10 cm. , then the corresponding height is ..... cm.

   (a) 12 (b) 25 (c) 5 (d) 10

4. A square is of perimeter 4 cm. , then its area equals ..... cm^2

   (a) 4 (b) 1 (c) 16 (d) 8

5. If the ratio between the perimeters of two similar polygons is 4 : 7 , then the ratio between the lengths of two corresponding sides of the two polygons is .....

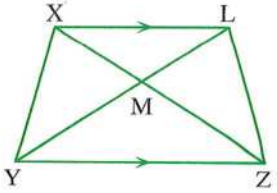
   (a) 2 : 7 (b) 4 : 7 (c) 7 : 4 (d) 2 : 1

3 [a] In the opposite figure :

$\overline{XL} \parallel \overline{YZ}$

, M is the point of intersection of the diagonals.

Prove that : The area of Δ ZML = the area of Δ YMX



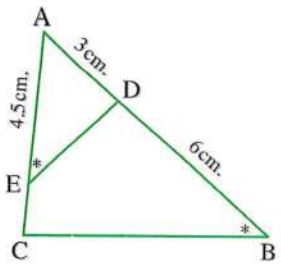
[b] In the opposite figure :

m (∠ AED) = m (∠ B) , AD = 3 cm.

, AE = 4.5 cm. , DB = 6 cm.

1 **Prove that :** Δ ADE ~ Δ ACB

2 **Find :** The length of $\overline{EC}$



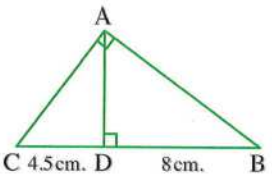
4 [a] In the opposite figure :

m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

, CD = 4.5 cm. and DB = 8 cm.

Find : 1 The length of $\overline{AC}$

2 The area of Δ ABC



[b] In the opposite figure :

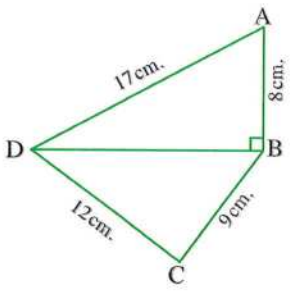
m (∠ ABD) = 90° , AB = 8 cm.

, AD = 17 cm. , BC = 9 cm.

, DC = 12 cm.

1 **Find :** The length of $\overline{BD}$

2 **Prove that :** m (∠ C) = 90°



5 [a] A parallelogram , whose side lengths are 5 cm. and 7 cm. and its smaller height is 4 cm. Find the area of the parallelogram and the greater height.

[b] XYZ is a triangle where XY = 12 cm. , YZ = 13 cm. , XZ = 4 cm. Determine the type of the triangle according to the measures of its angles.

8 El-Monofia Governorate

Quesna Educational Directorate
Math Supervision

Answer the following questions :

1 Complete :

1 The area of a square is 50 cm^2 , then the length of its diagonal is .....

2 The median of a triangle divides its surface into two triangles .....

3 If the point A ∈ the straight line L , then the projection of A on L is .....

4 The area of a triangle is equal to half of the area of a parallelogram if they have .....

5 The type of the triangle ABC where AB = 8 cm. , AC = 17 cm. , BC = 15 cm. according to its angles is .....

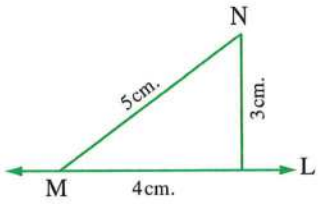
2 Choose the correct answer :

1 The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 3 : 5 (c) 5 : 4 (d) 5 : 2

2 **In the opposite figure :**

The length of the projection of $\overline{MN}$ on the straight line L is .....



(a) 3 cm. (b) 4 cm.

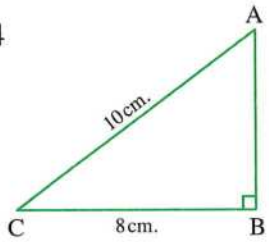
(c) 5 cm. (d) zero

3 The number of axes of symmetry of the isosceles trapezium is .....

(a) 1 (b) 2 (c) 3 (d) 4

4 **In the opposite figure :**

The area of Δ ABC is ..... cm^2



(a) 24 (b) 40

(c) 48 (d) 80

5 If Δ ABC is an obtuse-angled triangle at B , then $(AB)^2 + (BC)^2$ ..... $(AC)^2$

(a) < (b) > (c) ≤ (d) ≥

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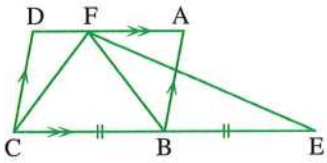
3 [a] In the opposite figure :

ABCD is a parallelogram , CB = BE

Prove that : The area of Δ FEC = the area of ▱ ABCD

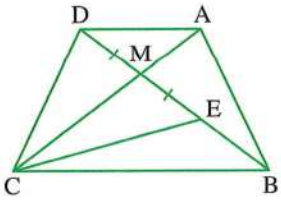


[b] In the opposite figure :

ME = MD

, the area of Δ AMB = the area of Δ CME

Prove that : $\overline{AD} // \overline{BC}$



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4 [a] Two pieces of land have equal area , one of them has the shape of a rhombus whose diagonal lengths are 18 m. , 24 m. and the other has the shape of a trapezium whose height is 12 m. Find the length of its middle base.

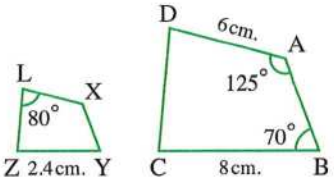
[b] In the opposite figure :

The figure ABCD ~ the figure XYZL

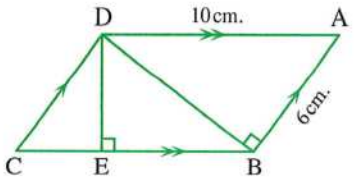
Calculate : m (∠ BCD) , the length of $\overline{XL}$

If the perimeter of ABCD = 26 cm.

, **find :** the perimeter of XYZL



5 [a] In the opposite figure :



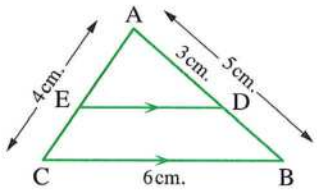
ABCD is a parallelogram , AB = 6 cm. , AD = 10 cm.
, $\overline{DB} \perp \overline{AB}$, $\overline{DE} \perp \overline{BC}$

Find : [1] The area of the parallelogram ABCD

[2] The length of the projection of $\overline{DB}$ on $\overleftrightarrow{BC}$

[3] The length of $\overline{DE}$

[b] In the opposite figure :



ABC is a triangle , AB = 5 cm.
, BC = 6 cm. , AC = 4 cm.
, AD = 3 cm. , $\overline{DE} // \overline{BC}$

[1] **Prove that :** $\Delta ADE \sim \Delta ABC$

[2] **Find :** The length of each of $\overline{ED}$ and $\overline{AE}$

9 El-Gharbia Governorate

The Central Math Supervision
Governorate Language Schools

Answer the following questions :

1 Complete the following :

[1] The diagonal length of the square whose area is 50 cm^2 equals .....

[2] Each of two polygons is similar to a third are .....

[3] ABC is a triangle , AB = 8 cm. , BC = 9 cm. and AC = 6 cm. , then its type according to its angles is .....

[4] The projection of a line segment on a straight line perpendicular to it is .....

[5] The measure of the angle of the regular octagon equals .....°

2 Choose the correct answer from those given :

[1] In ΔXYZ , if $(XZ)^2 = (XY)^2 - (ZY)^2$, then $\angle Y$ is ..... angle.

(a) a straight (b) an obtuse (c) a right (d) an acute

[2] ABCD is a parallelogram in which m ($\angle A$) = 70° , then m ($\angle B$) = ...

(a) 70° (b) 110° (c) 180° (d) 140°

[3] If the area of a triangle is 24 cm^2 and its height is 8 cm. , then the length of the corresponding base is ..... cm.

(a) 16 (b) 6 (c) 3 (d) 12

[4] A trapezium whose lengths of two parallel bases are 6 cm. and 8 cm. , then the length of its middle base equals ..... cm.

(a) 48 (b) 24 (c) 14 (d) 7

5 If the perimeter of a square equals $(3x - 1)$ cm. and the area of this square equals $25\ cm^2$, then $x =$ .....

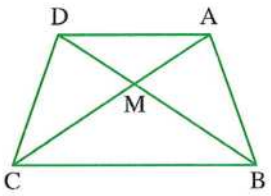
(a) 5 (b) 8 (c) 6 (d) 7

3 [a] In the opposite figure :

ABCD is a quadrilateral

, the area of Δ AMB = the area of Δ DMC

Prove that : $\overline{AD} // \overline{BC}$



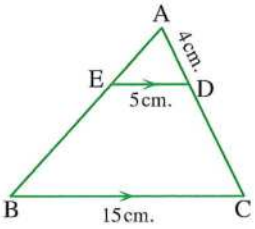
[b] In the opposite figure :

$\overline{ED} // \overline{BC}$, AD = 4 cm.

, ED = 5 cm.

, BC = 15 cm.

Find with proof : the length of $\overline{DC}$

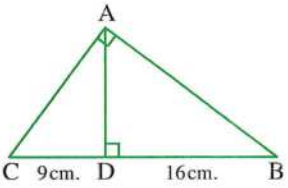


4 [a] In the opposite figure :

m ($\angle$ BAC) = 90° , $\overline{AD} \perp \overline{CB}$

, CD = 9 cm. , DB = 16 cm.

Find : The length of each of $\overline{AB}$, $\overline{AC}$ and $\overline{AD}$



[b] ABCD is a trapezium in which $\overline{AD} // \overline{BC}$, if BC = 2 AD = 20 cm. and its area = $180\ cm^2$. , find its height.

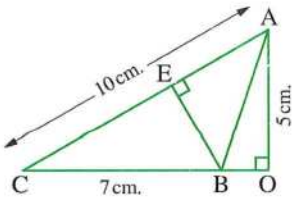
5 [a] In the opposite figure :

$\overline{AO} \perp \overleftrightarrow{CB}$, $\overline{BE} \perp \overline{AC}$

, AC = 10 cm. , BC = 7 cm. and AO = 5 cm.

Find : 1 The length of $\overline{BE}$

2 The area of Δ ABC



[b] ABCD is a parallelogram in which AB = 8 cm. , AC = 20 cm. and BD = 12 cm.

Prove that : m ($\angle$ ABD) = 90° **, then find :** the area of this parallelogram.

10 El-Dakahlia Governorate — Maths Supervision

Answer the following questions :

1 Choose the correct answer from those given :

1 If the height of a triangle is 8 cm. , its corresponding base length is 6 cm. , then its surface area equals ..... cm^2

(a) 24 (b) 42 (c) 48 (d) 68

2 If the perimeter of a square is 20 cm. , then its area equals .....

(a) 20 cm^2 (b) 25 cm^2 (c) 50 cm^2 (d) 100 cm^2

3 The rhombus whose lengths of its diagonals are 6 cm. , 10 cm. , then its area equals ..... cm^2

(a) 10 (b) 15 (c) 30 (d) 60

4 The length of the middle base of a trapezium whose parallel base lengths are 6 cm. , 8 cm. is ..... cm.

(a) 7 (b) 14 (c) 24 (d) 48

5 Δ ABC is right-angled at B , AB = 6 cm. , BC = 8 cm. , $\overline{BD} \perp \overline{AC}$ intersecting it at D , then the length of $\overline{BD}$ = ... cm.

(a) 5 (b) 10 (c) 4.8 (d) 2.4

2 Complete each of the following :

1 If the enlargement ratio of two similar polygons = 1 , then the two polygons are .....

2 The number of rectangles in the opposite figure is .....

3 If Δ ABC is obtuse-angled at B , then $(AC)^2$ ..... $(AB)^2 + (BC)^2$

4 If $\Delta ABC \sim \Delta XYZ$, $m(\angle A) + m(\angle B) = 100°$, then $m(\angle Z)$ = ...°

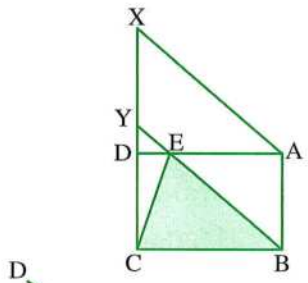
5 The triangle whose side lengths are 6 cm. , 8 cm. , 11 cm. , then its type according to its angles is .....

3 [a] In the opposite figure :

ABCD is a rectangle , ABYX is a parallelogram

Prove that :

The area of Δ EBC = $\frac{1}{2}$ the area of the parallelogram ABYX



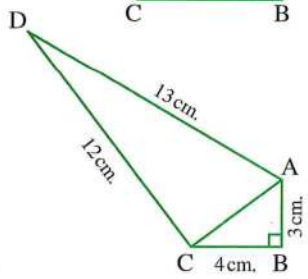
[b] In the opposite figure :

$m(\angle B) = 90°$

, AB = 3 cm. , BC = 4 cm.

, DA = 13 cm. , DC = 12 cm.

Prove that : $m(\angle ACD) = 90°$



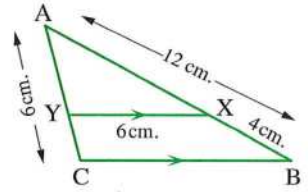
4 [a] In the opposite figure :

$\overline{XY} // \overline{BC}$, AC = XY = 6 cm.

, AB = 12 cm. , XB = 4 cm.

1 **Prove that :** $\Delta AXY \sim \Delta ABC$

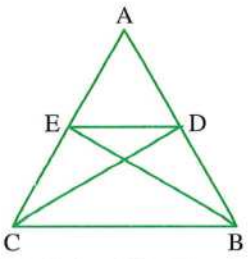
2 **Find :** The length of $\overline{BC}$



[b] In the opposite figure :

The area of Δ ABE = the area of Δ ACD

Prove that : $\overline{DE} \parallel \overline{BC}$

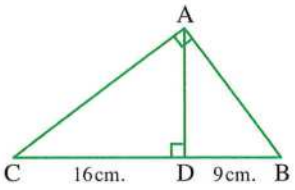


5 [a] In the opposite figure :

Δ ABC is right-angled at A , $\overline{AD} \perp \overline{BC}$

, BD = 9 cm. , CD = 16 cm.

Find : The length of each of $\overline{AB}$, $\overline{AD}$



[b] Find the area of the trapezium with two parallel base lengths 8 cm. , 10 cm. and its height is 6 cm.

11 Ismailia Governorate

Directorate of Education
Directing Mathematics

Answer the following questions :

1 Choose the correct answer :

1 The rhombus whose diagonal lengths are 6 cm. , 10 cm. has an area ..... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

2 In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then $\angle$ C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

3 The rectangle has ..... axes of symmetry.

(a) 1 (b) 2 (c) 3 (d) 4

4 If the area of a triangle is 24 cm^2 and its height is 8 cm. , then the length of the corresponding base equals ..... cm.

(a) 16 (b) 6 (c) 3 (d) 2

5 The diagonal length of a square whose area is 18 cm^2 is ..... cm.

(a) 2 (b) 6 (c) 9 (d) 36

2 Complete the following :

1 The sum of measures of two complementary angles is .....°

2 The area of the parallelogram = ... the area of the triangle with common base and lies between two parallel lines one of them carrying this base.

3 The projection of the point (7 , 4) on the y-axis is the point .....

4 The two diagonals of an isosceles trapezium are .....

5 If the lengths of two adjacent sides in a parallelogram are 6 cm. , 7 cm. and its smaller height is 5 cm. , then its area is ..... cm^2.

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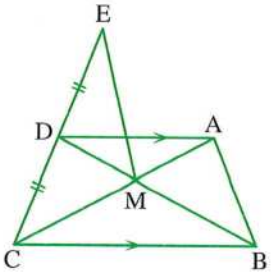
3 **[a] In the opposite figure :**

$\overline{AD} // \overline{BC}$

, D is the midpoint of $\overline{EC}$

Prove that :

The area of Δ ABM = the area of Δ DME



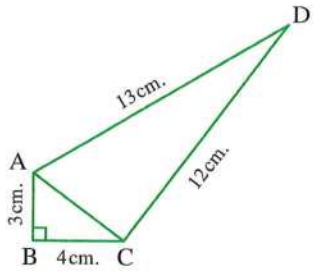
[b] In the opposite figure :

m ($\angle$ B) = 90°

, AB = 3 cm. , BC = 4 cm.

, AD = 13 cm. , DC = 12 cm.

Prove that : m ($\angle$ ACD) = 90°



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4 **[a]** Find the area of the trapezium with two parallel base lengths 8 cm. , 10 cm. and its height is 6 cm.

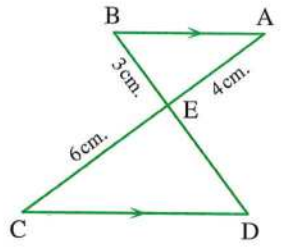
[b] In the opposite figure :

$\overline{AB} // \overline{CD}$, $\overline{AC} \cap \overline{BD} = \{E\}$

, AE = 4 cm. , BE = 3 cm. , CE = 6 cm.

1 **Prove that :** Δ ABE ~ Δ CDE

2 **Find :** The length of $\overline{ED}$



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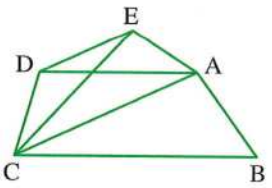
5 **[a] In the opposite figure :**

The area of the figure ABCD = the area of the figure ABCE

Prove that : $\overline{AC} // \overline{ED}$

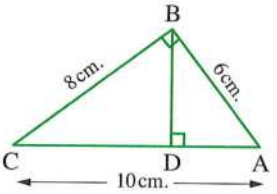


[b] In the opposite figure :

Δ ABC is right-angled at B , $\overline{BD} \perp \overline{AC}$

, AB = 6 cm. , BC = 8 cm. , AC = 10 cm.

Find : The length of each of $\overline{BD}$ and $\overline{CD}$



12 Suez Governorate

Directorate of Education
Inspection of Mathematics

Answer the following questions :

1 Choose the correct answer :

1 In ΔABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then $\angle C$ is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) ≠

3 In ΔABC , if $(AB)^2 = (AC)^2 + (BC)^2$, $m(\angle B) = 50°$, then $m(\angle A)$ = ... °

(a) 50 (b) 40 (c) 90 (d) 130

4 If ABCD is a parallelogram , $m(\angle A) + m(\angle C) = 160°$, then $m(\angle B)$ = ... °

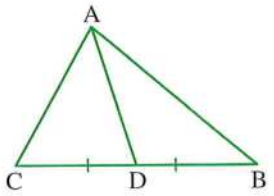
(a) 80 (b) 100 (c) 160 (d) 360

5 **In the opposite figure :**

ABC is a triangle , $\overline{AD}$ is a median ,

then the ratio between

the area of ΔADB : the area of ΔABC is .....



(a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 3 : 1

2 Complete :

1 If $\Delta ABC \sim \Delta XYZ$, $m(\angle A) + m(\angle B) = 80°$, then $m(\angle Z)$ = ... °

2 If the area of a square is 50 cm^2 , then the length of its diagonal is ..... cm.

3 If the two triangles are similar , then their corresponding sides are .....

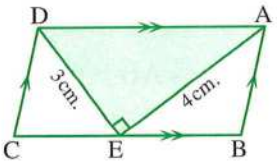
4 If $\overline{AB} \perp \overline{BC}$, then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

5 The area of a triangle is equal to half of the area of a parallelogram , if they have a common base .....

3 [a] In the opposite figure :

ABCD is a parallelogram , AE = 4 cm.

, DE = 3 cm. , $m(\angle AED) = 90°$



Complete : 1 The area of ΔAED = ... cm^2

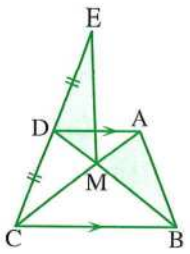
2 The area of the parallelogram ABCD = ... cm^2

[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$

, D is the midpoint of $\overline{EC}$

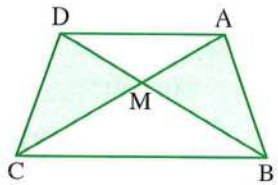
Prove that : The area of Δ AMB = the area of Δ DME



4 [a] In the opposite figure :

If the area of Δ AMB = the area of Δ DMC

, prove that : $\overline{AD}$ // $\overline{BC}$



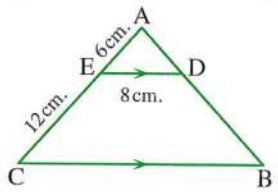
[b] In the opposite figure :

$\overline{ED}$ // $\overline{BC}$, ED = 8 cm. , AE = 6 cm.

, EC = 12 cm.

1 **Prove that :** Δ ADE ~ Δ ABC

2 **Find :** The length of $\overline{BC}$

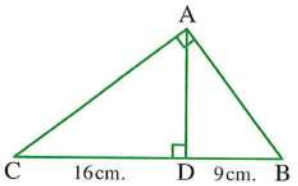


5 [a] In the opposite figure :

$\overline{AD} \perp \overline{BC}$, m (∠ BAC) = 90°

, DB = 9 cm. , DC = 16 cm.

Find : The length of each of $\overline{AB}$, $\overline{AD}$, $\overline{AC}$



[b] In the opposite figure :

m (∠ C) = 90° , $\overline{AE} \perp \overline{BD}$

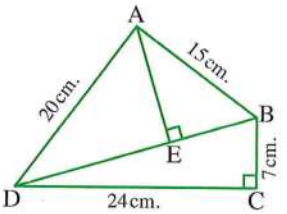
, BC = 7 cm. , CD = 24 cm.

, AB = 15 cm. , AD = 20 cm.

1 **Find :** The length of $\overline{BD}$

2 **Prove that :** m (∠ BAD) = 90°

3 **Find :** The length of $\overline{AE}$



13 Damietta Governorate — Math Supervision

Answer the following questions :

1 Choose the correct answer from those given :

1 The area of the rhombus whose diagonal lengths are 8 cm. and 10 cm. equals ..... cm^2

(a) 80 (b) 40 (c) 20 (d) 18

2 If the projection of a line segment on a straight line is a point , then the line segment ..... the straight line.

(a) // (b) $\perp$ (c) $\equiv$ (d) $\subset$

3 If the length of the base of a triangle is 6 cm. and its corresponding height is 3 cm. , then its area equals ..... cm^2.

(a) 18 (b) 9 (c) 6 (d) 2

4 A square whose diagonal length is 6 cm. , then its area equals ..... cm^2.

(a) 36 (b) 24 (c) 12 (d) 18

5 The two vertically opposite angles are .....

(a) complementary. (b) supplementary. (c) adjacent. (d) equal in measure.

2 Complete the following :

1 The area of the parallelogram = ... × its corresponding height.

2 If the ratio between two corresponding side lengths in two similar polygons is 3 : 4 , then the ratio between their perimeters is .....

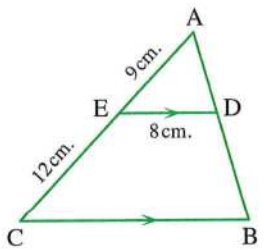
3 In Δ ABC , if $(AB)^2 = (AC)^2 + (BC)^2$, then m ($\angle$ .....) = 90°

4 If Δ ABC $\sim$ Δ DEF and m ($\angle$ C) = 70° , then m ($\angle$ F) = ...°

5 The number of diagonals of the quadrilateral equals .....

3 [a] In the opposite figure :

ABC is a triangle , $\overline{ED} // \overline{BC}$, AE = 9 cm. , EC = 12 cm. , ED = 8 cm.

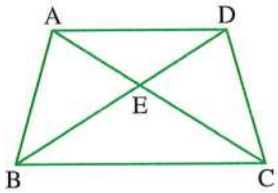


1 **Prove that :** Δ ABC $\sim$ Δ ADE

2 **Find :** The length of $\overline{BC}$

[b] In the opposite figure :

The area of Δ AEB = The area of Δ DEC

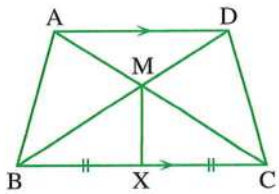


Prove that :

$\overline{AD} // \overline{BC}$

4 [a] In the opposite figure :

$\overline{AD} // \overline{BC}$, X is the midpoint of $\overline{BC}$



Prove that :

The area of the figure ABXM = The area of the figure DCXM

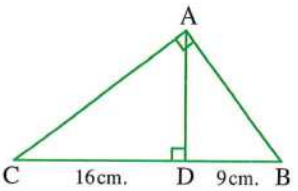
[b] ABCD is a trapezium in which $\overline{AD} // \overline{BC}$, if BC = 2 AD = 20 cm. and its area = 180 cm^2. , find its height.

5 **[a] In the opposite figure :**

ABC is a triangle , m (∠ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , DC = 16 cm.

Find : AD , AB , AC



[b] Determine the type of the triangle ABC according to its angles where AB = 7 cm. , BC = 6 cm. , AC = 9 cm.

14 El-Fayoum Governorate — Math Supervision

Answer the following questions :

1 **Choose the correct answer from the given ones :**

1 A rectangle its width is 6 cm. and its length is 8 cm. , then its diagonal length is ..... cm.

(a) 14 (b) 48 (c) 4 (d) 10

2 The diagonal length of a square = 8 cm. , then its area = ... cm^2

(a) 24 (b) 32 (c) 64 (d) 12

3 A circle its area = 16 π cm^2 , then its diameter length = ... cm.

(a) 7 (b) 16 (c) 32 (d) 8

4 ABC is an obtuse-angled triangle at B , then $(AC)^2$ ..... $(AB)^2 + (BC)^2$

(a) < (b) = (c) > (d) ≤

5 ABCD is a rectangle , then the projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ is .....

(a) $\overline{AB}$ (b) $\overline{BC}$ (c) $\overline{CD}$ (d) $\overline{AD}$

2 **Complete the following :**

1 If two polygons are similar , then the corresponding side lengths are ..... and the corresponding angles are .....

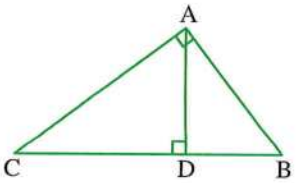
2 In the triangle ABC , if $(AB)^2 = (AC)^2 - (BC)^2$, then m (∠ .....) = 90°

3 Triangles with congruent bases on one straight line and have a common vertex are .....

4 The perimeter of a rhombus is 24 cm. and its area is 30 cm^2 , then its height is ..... cm.

5 **In the opposite figure :**

$(AC)^2$ = CD × .....



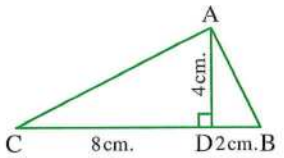
3 **[a] In the opposite figure :**

ABC is a triangle in which :

BD = 2 cm. , CD = 8 cm. , AD = 4 cm.

, $\overline{AD} \perp \overline{BC}$

Prove that : m ($\angle$ BAC) = 90°

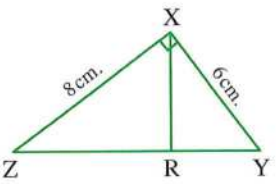


[b] In the opposite figure :

Δ XYZ is similar to Δ RYX , m ($\angle$ YXZ) = 90°

Prove that : $\overline{XR} \perp \overline{YZ}$ and if XY = 6 cm. , XZ = 8 cm.

, **find :** the length of $\overline{RZ}$



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4 **[a] In the opposite figure :**

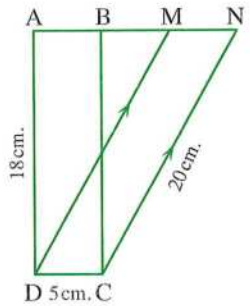
ABCD is a rectangle , M $\in \overleftrightarrow{AB}$, N $\in \overleftrightarrow{AB}$

, $\overline{CN} // \overline{DM}$, CD = 5 cm. , AD = 18 cm.

1 **Find :** The area of the figure MNCD

2 If CN = 20 cm.

, find the length of the perpendicular from M to $\overline{CN}$



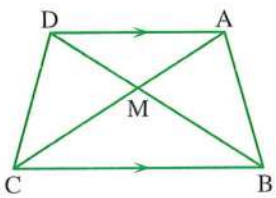
[b] In the opposite figure :

ABCD is a quadrilateral in which

$\overline{CB} // \overline{DA}$

Prove that :

The area of the triangle AMB = the area of the triangle DMC



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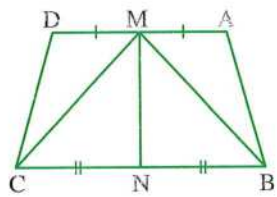
5 **[a] In the opposite figure :**

ABCD is a quadrilateral , AM = MD

, CN = NB

, the area of the figure ABNM = the area of the figure DCNM

Prove that : $\overline{CB} // \overline{DA}$



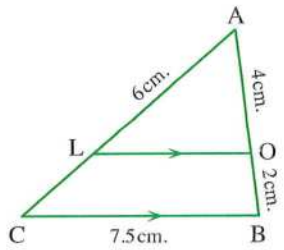
[b] In the opposite figure :

ABC is a triangle , $\overline{BC} // \overline{OL}$

, AO = 4 cm. , BO = 2 cm. , AL = 6 cm. , BC = 7.5 cm.

1 **Prove that :** Δ ABC is similar to Δ AOL

2 **Find :** The lengths of $\overline{LC}$ and $\overline{OL}$



15 Aswan Governorate

Kom Ombo Educational Directorate
Al-Qahmury Formal Language School

Answer the following questions :

1 Choose the correct answer :

1 The area of a rhombus whose two diagonal lengths are 6 cm. and 10 cm. is ..... cm^2.

(a) 60 (b) 30 (c) 15 (d) 10

2 The number of axes of symmetry of a square equals .....

(a) 1 (b) 2 (c) 3 (d) 4

3 All ..... are similar.

(a) squares. (b) triangles. (c) rectangles. (d) parallelograms

4 In ΔABC , if $(AB)^2 = (AC)^2 + (BC)^2 + 4$, then $\angle C$ is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

5 The area of a triangle is 24 cm^2 and its height is 8 cm. , then the length of the corresponding base is ..... cm.

(a) 16 (b) 6 (c) 3 (d) 12

2 Complete the following :

1 In ΔABC , if $(AC - BC)(AC + BC) = (AB)^2$, then m ($\angle$ .....) = 90°

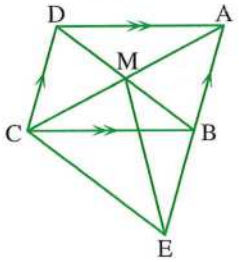
2 If $\overline{AB} \perp \overleftrightarrow{BC}$, then the length of the projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ equals .....

3 If $\Delta ABC \sim \Delta XYZ$ and m ($\angle A$) + m ($\angle B$) = 60° , then m ($\angle Z$) = ...°

4 The diagonal length of the square whose area is 50 cm^2 equals ..... cm.

5 The area of the circle of diameter length 14 cm. is ..... cm^2 (Where $\pi = \frac{22}{7}$)

3 [a] In the opposite figure :



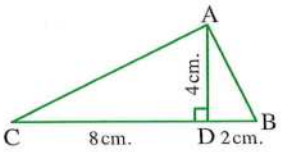
ABCD is a parallelogram

, $\overline{AC} \cap \overline{DB} = \{M\}$, $E \in \overrightarrow{AB}$

where the area of ΔAME = the area of ΔABC

Prove that : The figure BECD is a parallelogram.

[b] In the opposite figure :

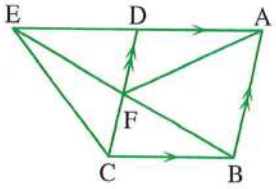


ABC is a triangle in which : BD = 2 cm.

, CD = 8 cm. , AD = 4 cm. , $\overline{AD} \perp \overline{BC}$

Prove that : m ($\angle BAC$) = 90°

4 **[a] In the opposite figure :**



ABCD is a parallelogram

, $E \in \overrightarrow{AD}$, $\overline{BE} \cap \overline{CD} = \{F\}$

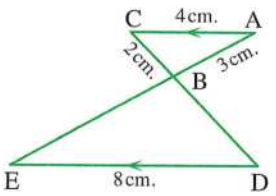
Prove that :

The area of the triangle AFD = the area of the triangle EFC

[b] Determine the type of the triangle XYZ according to its angles , where XY = 8 cm. , YZ = 11 cm. and XZ = 6 cm.

---

5 **[a] In the opposite figure :**



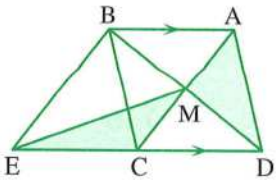
$\overline{AC} // \overline{DE}$, AC = 4 cm. , AB = 3 cm.

, CB = 2 cm. and DE = 8 cm.

1 **Prove that :** $\Delta ABC \sim \Delta EBD$

2 **Find :** The length of $\overline{BE}$

[b] In the opposite figure :



$\overline{AB} // \overline{CD}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, the area of the triangle AMD = the area of the triangle MCE

Prove that : $\overline{MC} // \overline{BE}$

Answers of the schools examinations on Geometry

1 Cairo

1 [1] (a) [2] (b) [3] (a) [4] (a) [5] (c)

2 [1] equal [2] 120° [3] 28 [4] 6 [5] a right angle

3

[a] In Δ ABC :

∵ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

∴ $(AB)^2 = BD \times BC = 9 \times 25 = 225$

∴ AB = 15 cm.

, $(AC)^2 = CD \times CB = 16 \times 25 = 400$

∴ AC = 20 cm.

, $(AD)^2 = BD \times CD = 9 \times 16 = 144$

∴ AD = 12 cm. (The req.)

[b] ∵ The area of Δ AMB = the area of Δ CMD

Adding the area of Δ CMB to both sides

∴ The area of Δ ACB = the area of Δ DBC

and they have a common base $\overline{BC}$ and on one side of it

∴ $\overline{AD} // \overline{BC}$ (Q.E.D.)

4

[a] In ΔΔ ADE , CBE :

∵ $\overline{AD} // \overline{BC}$, $\overrightarrow{AC}$ is a transversal

∴ m (∠ A) = m (∠ C) (alternate angles) (1)

, ∵ $\overline{AD} // \overline{BC}$, $\overrightarrow{BD}$ is a transversal

∴ m (∠ D) = m (∠ B) (alternate angles) (2)

, ∵ m (∠ AED) = m (∠ CEB) (V.O.A.) (3)

From (1) , (2) and (3) :

∴ Δ ADE ~ Δ CBE (First req.)

∴ $\frac{AD}{CB} = \frac{DE}{BE} = \frac{AE}{CE}$ ∴ $\frac{4}{8} = \frac{2}{BE}$

∴ $BE = \frac{2 \times 8}{4} = 4$ cm. (Second req.)

[b] In Δ BAC :

∵ $(AC)^2 = (12)^2 = 144$

, $(AB)^2 + (BC)^2 = (7)^2 + (9)^2 = 130$

∴ $(AC)^2 > (AB)^2 + (BC)^2$

∴ Δ BAC is an obtuse-angled triangle. (The req.)

5

[a] ∵ Δ BFC , ▱ ABCD have the common base $\overline{BC}$

, ∵ F ∈ $\overline{AD}$

∴ The area of Δ BFC = $\frac{1}{2}$ the area of ▱ ABCD (1)

∵ $\overline{FB}$ is a median in Δ FEC

∴ The area of Δ BFC = $\frac{1}{2}$ the area of Δ FEC (2)

From (1) and (2) :

∴ The area of Δ FEC = The area of ▱ ABCD (Q.E.D.)

[b] In Δ ABC :

∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$

∴ AC = 15 cm.

In Δ ADC :

∵ $(CD)^2 = (17)^2 = 289$

, $(AD)^2 + (AC)^2 = (8)^2 + (15)^2 = 289$

∴ $(CD)^2 = (AD)^2 + (AC)^2$

∴ m (∠ DAC) = 90° (Q.E.D.)

2 Cairo

1 [1] (b) [2] (b) [3] (a) [4] (c) [5] (c)

2 [1] equal [2] height [3] 25 [4] YZL [5] 180°

3

[a] ∵ ΔΔ ACD , BCD have a common base $\overline{CD}$

, $\overline{AB} // \overline{DC}$

∴ The area of Δ ACD = the area of Δ BCD

Subtracting the area of Δ MCD from both sides

∴ The area of Δ AMD = the area of Δ BMC (Q.E.D.)

[b] In Δ ABC :

∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (12)^2 + (16)^2 = 400$

∴ AC = 20 cm. (First req.)

In Δ ACD :

$\because (CD)^2 = (25)^2 = 625$

, $(AD)^2 + (AC)^2 = (15)^2 + (20)^2 = 625$

$\therefore (CD)^2 = (AD)^2 + (AC)^2$

$\therefore$ m (∠ DAC) = 90°

$\therefore$ Δ ADC is a right-angled triangle. (Second req.)

4

[a] In Δ ABC :

$\because (AB)^2 = (7)^2 = 49$

, $(BC)^2 + (AC)^2 = (3)^2 + (6)^2 = 45$

$\therefore (AB)^2 > (BC)^2 + (AC)^2$

$\therefore$ Δ ABC is an obtuse-angled triangle.

(The req.)

[b] In ΔΔ ADE , ACB :

$\because$ m (∠ AED) = m (∠ B)

, ∠ A is a common angle

$\therefore$ m (∠ ADE) = m (∠ C)

$\therefore$ Δ ADE ~ Δ ACB (First req.)

, $\frac{AD}{AC} = \frac{DE}{CB} = \frac{AE}{AB}$ $\therefore \frac{3}{AC} = \frac{4.5}{9}$

$\therefore AC = \frac{3 \times 9}{4.5} = 6$ cm.

$\therefore EC = 6 - 4.5 = 1.5$ cm. (Second req.)

5

[a] The area $= \left(\frac{6+4}{2}\right) \times 5 = 25$ cm.²

[b] $\because \overline{AE}$ is a median in Δ ABC

$\therefore$ The area of Δ ABE = the area of Δ ACE (1)

, $\because$ DE is a median in Δ DBC

$\therefore$ The area of Δ DBE = the area of Δ DCE (2)

Subtracting (2) from (1) :

$\therefore$ The area of Δ ABD = the area of Δ ACD

(Q.E.D.)

3 Giza

1 [1] (a) [2] (a) [3] (a)
[4] (c) [5] (a)

2 [1] 5 [2] 48
[3] equal in area [4] 50 [5] 12

3

[a] In Δ ABC :

$\because (AC)^2 = (10)^2 = 100$

, $(AB)^2 + (BC)^2 = (6)^2 + (8)^2 = 100$

$\therefore (AC)^2 = (AB)^2 + (BC)^2$

$\therefore$ m (∠ B) = 90°

$\therefore$ ∠ B is right. (The req.)

[b] In Δ ABC :

$\because$ m (∠ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$

$\therefore (AB)^2 = BD \times BC = 16 \times 25 = 400$

$\therefore AB = 20$ cm.

, $\because (AD)^2 = BD \times CD = 16 \times 9 = 144$

$\therefore AD = 12$ cm. (The req.)

4

[a] The area $= \left(\frac{4+6}{2}\right) \times 3 = 15$ cm.²

[b] In ΔΔ ABC , DBE :

$\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{CE}$ is a transversal

$\therefore$ m (∠ C) = m (∠ E) (alternate angles) (1)

, $\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{AD}$ is a transversal

$\therefore$ m (∠ A) = m (∠ D) (alternate angles) (2)

, $\because$ m (∠ CBA) = m (∠ EBD) (V.O.A.) (3)

From (1) , (2) and (3) :

$\therefore$ Δ ABC ~ Δ DBE (Q.E.D.)

5

[a] In Δ ABC :

$\because$ (∠ B) = 90°

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (3)^2 + (4)^2 = 25$

$\therefore AC = 5$ cm. (First req.)

In Δ ACD :

$\because (AD)^2 = (13)^2 = 169$

, $(AC)^2 + (CD)^2 = (5)^2 + (12)^2 = 169$

$\therefore (AD)^2 = (AC)^2 + (CD)^2$

$\therefore$ m (∠ ACD) = 90° (Second req.)

[b] In ΔΔ ACB , DCB have a common base $\overline{BC}$

, $\overline{DA} // \overline{CB}$

$\therefore$ The area of Δ ACB = the area of Δ DCB

Subtracting the area of Δ ECB from both sides

∴ The area of Δ AEB = The area of Δ DEC

(Q.E.D.)

4 Giza

1 [1] (b) [2] (b) [3] (a)
[4] (d) [5] (c)

2 [1] proportional , equal in measure [2] 120°
[3] > [4] 50 [5] 30 cm.

3

[a] In Δ ABD :

∵ $\overline{DB} \perp \overline{AB}$

∴ m (∠ ABD) = 90°

∴ $(BD)^2 = (AD)^2 - (AB)^2 = (17)^2 - (8)^2 = 225$

∴ BD = 15 cm. (First req.)

In Δ BCD :

∵ $(BD)^2 = (15)^2 = 225$

, $(BC)^2 + (CD)^2 = (9)^2 + (12)^2 = 225$

∴ $(BD)^2 = (BC)^2 + (CD)^2$

∴ m (∠ C) = 90° (Second req.)

[b] In Δ ABC :

∵ $(AC)^2 = (7)^2 = 49$

, $(AB)^2 + (BC)^2 = (5)^2 + (6)^2 = 61$

∴ $(AC)^2 < (AB)^2 + (BC)^2$

∴ Δ ABC is an acute-angled triangle. (The req.)

4

[a] In ΔΔ ABC , DBE :

∵ $\overline{AC} // \overline{ED}$, $\overleftrightarrow{AD}$ is a transversal

∴ m (∠ A) = m (∠ D) (alternate angles) (1)

, ∵ $\overline{AC} // \overline{ED}$, $\overleftrightarrow{CE}$ is a transversal

∴ m (∠ C) = m (∠ E) (alternate angles) (2)

, ∵ m (∠ ABC) = m (∠ DBE) (V.O.A.) (3)

From (1) , (2) and (3) :

∴ Δ ABC ~ Δ DBE (First req.)

, $\frac{AB}{DB} = \frac{BC}{BE} = \frac{AC}{DE}$ ∴ $\frac{3}{6} = \frac{5}{DE}$

∴ $DE = \frac{5 \times 6}{3} = 10$ cm.

∴ The perimeter of Δ BED = 8 + 10 + 6 = 24 cm.

(Second req.)

[b] ∵ The area of Δ ADC = the area of Δ AEB

Subtracting the area of Δ ADE from both sides

∴ The area of Δ CED = the area of Δ BDE

and they have a common base $\overline{DE}$ and on one side of it.

∴ $\overline{DE} // \overline{BC}$ (Q.E.D.)

5

[a] ∵ ΔΔ ACD , BCD have a common base $\overline{CD}$

, $\overline{AB} // \overline{CD}$

∴ The area of Δ ACD = the area of Δ BCD (1)

, ∵ $\overline{ME}$ is a median in Δ CMD

∴ The area of Δ EMC = the area of Δ EMD (2)

Subtracting (2) from (1) :

∴ The area of the figure ADEM
= the area of the figure BCEM (Q.E.D)

[b] In Δ ABC :

∵ m (∠ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$

∴ $(AD)^2 = BD \times CD = 4.5 \times 8 = 36$

∴ AD = 6 cm.

, $(AB)^2 = BD \times BC = 4.5 \times 12.5 = 56.25$

∴ AB = 7.5 cm.

, $(AC)^2 = CD \times BC = 8 \times 12.5 = 100$

∴ AC = 10 cm. (The req.)

5 Alexandria

1 [1] (a) [2] (a) [3] (c)
[4] (d) [5] (a)

2 [1] 24 [2] equal in measure
[3] 16
[4] parallelogram [5] 42

3

[a] In Δ XYZ :

∵ $(YZ)^2 = (7)^2 = 49$

, $(XY)^2 + (XZ)^2 = (4)^2 + (5)^2 = 41$

, ∵ $(YZ)^2 > (XY)^2 + (XZ)^2$

∴ ∠ X is obtuse. (The req.)

[b] The area = 50 × 24 = 1200 cm^2.

4

[a] In Δ XYZ :

$\because$ m (∠ XYZ) = 90° , $\overline{YL} \perp \overline{XZ}$

$\therefore (XZ)^2 = (XY)^2 + (YZ)^2 = (20)^2 + (15)^2 = 625$

$\therefore$ XZ = 25 cm. (First req.)

, $YL = \frac{YX \times YZ}{XZ} = \frac{20 \times 15}{25} = 12$ cm. (Second req.)

[b] $\because$ ΔΔ BAD , CAD have the same base $\overline{AD}$

, $\overline{AD} // \overline{BC}$

$\therefore$ The area of Δ BAD = the area of Δ CAD

Subtracting the area of Δ MAD from both sides

$\therefore$ The area of Δ BMA = the area of Δ CMD (1)

, $\because$ ΔΔ MAX , MDY have equal bases in length and on one straight line and they are common in the vertex M

$\therefore$ The area of Δ MAX = the area of Δ MDY (2)

Adding (1) and (2) :

$\therefore$ The area of the figure ABMX = the area of the figure DCMY (Q.E.D.)

5

[a] In ΔΔ ABC , AED :

$\because$ m (∠ B) = m (∠ E) = 90°

, m (∠ BAC) = m (∠ EAD) (V.O.A.)

$\therefore$ m (∠ C) = m (∠ D)

$\therefore$ Δ ABC ~ Δ AED (First req.)

$\therefore \frac{AB}{AE} = \frac{BC}{ED} = \frac{AC}{AD}$ $\therefore \frac{12}{3} = \frac{AB}{4}$

$\therefore AB = \frac{4 \times 12}{3} = 16$ cm.

$\therefore$ BE = 4 + 16 = 20 cm. (Second req.)

[b] The area = $\frac{1}{2} \times 8 \times 10 = 40$ cm^2

6 El-Kalyoubia

1 [1] (b) [2] (b) [3] (c)
[4] (c) [5] (b)

2 [1] 120° [2] proportional
[3] 24 [4] equal in area
[5] congruent

3

[a] The length of the middle base = $\frac{1}{2}$ (8 + 10) = 9 cm.

, the area of the trapezium = 9 × 5 = 45 cm^2

[b] $\because$ ΔΔ ABC , DBC have a common base $\overline{BC}$

, $\overline{AD} // \overline{BC}$

$\therefore$ The area of Δ ABC = the area of Δ DBC

Subtracting the area of Δ MBC from both sides

$\therefore$ The area of Δ AMB = the area of Δ DMC (1)

, $\because$ $\overline{MX}$ is a median in Δ MBC

$\therefore$ The area of Δ BMX = the area of Δ CMX (2)

Adding (1) and (2) :

$\therefore$ The area of the figure ABXM = the area of the figure DCXM (Q.E.D.)

4

[a] In Δ ABC :

$\because$ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

$\therefore (AD)^2 = DB \times DC = 9 \times 16 = 144$

$\therefore$ AD = 12 cm.

, $(AB)^2 = BD \times BC = 9 \times 25 = 225$

$\therefore$ AB = 15 cm.

, $(AC)^2 = CD \times BC = 16 \times 25 = 400$

$\therefore$ AC = 20 cm. (The req.)

[b] In ΔΔ ABC , DBE

$\because$ $\overline{AC} // \overline{ED}$, $\overrightarrow{AD}$ is a transversal

$\therefore$ m (∠ A) = m (∠ D) (alternate angles) (1)

, $\because$ $\overline{AC} // \overline{ED}$, $\overleftrightarrow{CE}$ is a transversal

$\therefore$ m (∠ C) = m (∠ E) (alternate angles) (2)

, $\because$ m (∠ ABC) = m (∠ DBE) (V.O.A.) (3)

From (1) , (2) and (3) :

$\therefore$ Δ ABC ~ Δ DBE (First req.)

, $\frac{AB}{DB} = \frac{BC}{BE} = \frac{AC}{DE}$ $\therefore \frac{AB}{18} = \frac{5}{15} = \frac{3}{DE}$

$\therefore AB = \frac{18 \times 5}{15} = 6$ cm.

, $DE = \frac{3 \times 15}{5} = 9$ cm. (Second req.)

5

[a] In Δ ABC :

$\because$ m (∠ B) = 90°

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (3)^2 + (4)^2 = 25$

$\therefore$ AC = 5 cm. (First req.)

In Δ ACD :

$\because (CD)^2 = (13)^2 = 169$

, $(AD)^2 + (AC)^2 = (12)^2 + (5)^2 = 169$

, $\because (CD)^2 = (AD)^2 + (AC)^2$

$\therefore$ m (∠ DAC) = 90° (Second req.)

[b] ∵ The area of Δ ABE = the area of Δ ACD

Subtracting the area of Δ ADE from both sides

∴ The area of Δ BED = the area of Δ CDE

and they have a common base $\overline{ED}$ and on one side of it

∴ $\overline{DE} // \overline{BC}$ (Q.E.D.)

7 El-Sharkia

1 [1] 5 [2] C

[3] base length [4] X [5] equal

2 [1] (c) [2] (d) [3] (c)

[4] (b) [5] (b)

3

[a] ∵ ΔΔ LYZ , XYZ have the common base $\overline{YZ}$

, $\overline{XL} // \overline{YZ}$

∴ The area of Δ LYZ = the area of Δ XYZ

Subtracting the area of Δ MYZ from both sides.

∴ The area of Δ ZML = the area of Δ YMX

(Q.E.D.)

[b] In ΔΔ ADE , ACB :

∵ m (∠ AED) = m (∠ B)

, ∠ A is a common angle

∴ m (∠ ADE) = m (∠ C)

∴ Δ ADE ~ Δ ACB (First req.)

, $\frac{AD}{AC} = \frac{DE}{CB} = \frac{AE}{AB}$ ∴ $\frac{3}{AC} = \frac{4.5}{9}$

∴ $AC = \frac{3 \times 9}{4.5} = 6$ cm.

∴ EC = 6 – 4.5 = 1.5 cm. (Second req.)

4

[a] In Δ ABC :

∵ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

∴ $(AC)^2 = CD \times BC = 4.5 \times 12.5 = 56.25$

∴ AC = 7.5 cm. (First req.)

, $(AD)^2 = CD \times BD = 4.5 \times 8 = 36$

∴ AD = 6 cm.

∴ The area of Δ ABC = $\frac{1}{2} \times 12.5 \times 6 = 37.5$ cm^2

(Second req.)

[b] In Δ ABD :

∵ m (∠ ABD) = 90°

∴ $(BD)^2 = (AD)^2 - (AB)^2 = (17)^2 - (8)^2 = 225$

∴ BD = 15 cm. (First req.)

In Δ BCD :

∵ $(BD)^2 = (15)^2 = 225$

, $(BC)^2 + (CD)^2 = (9)^2 + (12)^2 = 225$

∴ $(BD)^2 = (BC)^2 + (CD)^2$

∴ m (∠ C) = 90° (Second req.)

5

[a] The area of the parallelogram = 7 × 4 = 28 cm^2

the greater height = 28 ÷ 5 = 5.6 cm.

[b] In Δ XYZ :

∵ $(YZ)^2 = (13)^2 = 169$

, $(XY)^2 + (XZ)^2 = (12)^2 + (4)^2 = 160$

∴ $(YZ)^2 > (XY)^2 + (XZ)^2$

∴ Δ XYZ is an obtuse-angled triangle. (The req.)

8 El-Monofia

1 [1] 10 cm. [2] equal in area

[3] A

[4] a common base lying on one of two parallel straight lines including them.

[5] a right-angled triangle.

2 [1] (b) [2] (b) [3] (a)

[4] (a) [5] (a)

3

[a] ∵ Δ BFC , ▱ ABCD have the common base $\overline{BC}$

, ∵ F ∈ $\overline{AD}$

∴ The area of Δ BFC = $\frac{1}{2}$ the area of ▱ ABCD (1)

∵ $\overline{FB}$ is a median in Δ FEC

∴ The area of Δ BFC = $\frac{1}{2}$ the area of Δ FEC (2)

From (1) and (2) :

∴ The area of Δ FEC = the area of ▱ ABCD

(Q.E.D.)

[b] ∵ $\overline{CM}$ is a median in Δ CDE

∴ The area of Δ CMD = the area of Δ CME

, ∵ the area of Δ AMB = the area of Δ CME

∴ The area of Δ AMB = the area of Δ CMD

Adding the area of Δ ADM to both sides

∴ The area of Δ ABD = the area of Δ ACD

and they have a common base $\overline{AD}$ and on one side of it.

∴ $\overline{AD} // \overline{BC}$ (Q.E.D.)

4

[a] ∵ The area of the rhombus = $\frac{1}{2} \times 18 \times 24 = 216$ m^2.

∴ The area of the trapezium = 216 m^2.

∴ The length of the middle base = 216 ÷ 12 = 18 m.

[b] ∵ The figure ABCD ~ the figure XYZL

∴ m (∠ D) = m (∠ L) = 80°

From the figure ABCD :

∴ m (∠ BCD) = 360° − (125° + 70° + 80°) = 85° (First req.)

∴ $\frac{AD}{XL} = \frac{BC}{YZ}$ ∴ $\frac{6}{XL} = \frac{8}{2.4}$

∴ XL = $\frac{6 \times 2.4}{8}$ = 1.8 cm. (Second req.)

, ∵ $\frac{\text{the perimeter of the figure ABCD}}{\text{the perimeter of the figure XYZL}} = \frac{BC}{YZ}$

∴ $\frac{26}{\text{The perimeter of the figure XYZL}} = \frac{8}{2.4}$

∴ The perimeter of the figure XYZL

= $\frac{26 \times 2.4}{8}$ = 7.8 cm. (Third req.)

5

[a] ∵ Δ ABD is right-angled at B

∴ $(BD)^2 = (AD)^2 - (AB)^2 = (10)^2 - (6)^2 = 64$

∴ BD = 8 cm.

∴ The area of ▱ ABCD = AB × BD = 6 × 8

= 48 cm^2. (First req.)

∵ $\overline{AB} // \overline{DC}$ (Properties of parallelogram)

, $\overleftrightarrow{BD}$ is a transversal.

∴ m (∠ ABD) = m (∠ CDB) (alternate angles)

∴ m (∠ CDB) = 90°

∵ AB = DC , AD = BC

(properties of parallelogram)

∴ DC = 6 cm. , BC = 10 cm.

∵ $\overline{BE}$ is the projection of $\overline{DB}$ on $\overleftrightarrow{BC}$

, ∵ Δ DBC is right-angled at D , $\overline{DE} \perp \overline{BC}$

∴ $(BD)^2 = BE \times BC$ ∴ $64 = BE \times 10$

∴ BE = $\frac{64}{10}$ = 6.4 cm. (Second req.)

, DE = $\frac{DB \times DC}{BC} = \frac{8 \times 6}{10}$ = 4.8 cm. (Third req.)

[b] In ΔΔ ADE , ABC :

∵ $\overline{DE} // \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

∴ m (∠ ADE) = m (∠ B) (corresponding angles) (1)

, ∵ $\overline{DE} // \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

∴ m (∠ AED) = m (∠ C) (corresponding angles) (2)

, ∵ ∠ A is a common angle (3)

From (1) , (2) and (3) :

∴ Δ ADE ~ Δ ABC (First req.)

, $\frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$ ∴ $\frac{3}{5} = \frac{DE}{6} = \frac{AE}{4}$

∴ DE = $\frac{3 \times 6}{5}$ = 3.6 cm.

, AE = $\frac{3 \times 4}{5}$ = 2.4 cm. (Second req.)

9 El-Gharbia

1 [1] 10 cm. [2] similar

[3] acute-angled [4] a point [5] 135°

2 [1] (d) [2] (b) [3] (b)

[4] (d) [5] (d)

3

[a] ∵ The area of Δ AMB = the area of Δ DMC

Adding the area of Δ AMD to both sides

∴ The area of Δ ABD = the area of Δ ACD

but they have a common base $\overline{AD}$ and on one side of it

∴ $\overline{AD} // \overline{BC}$ (Q.E.D.)

[b] In ΔΔ AED , ABC :

∵ $\overline{ED} // \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

∴ m (∠ AED) = m (∠ B) (corresponding angles) (1)

, ∵ $\overline{ED} // \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

∴ m (∠ ADE) = m (∠ C) (corresponding angles) (2)

, ∵ ∠ A is a common angle (3)

From (1) , (2) and (3) :

∴ Δ AED ~ Δ ABC :

, $\frac{AE}{AB} = \frac{ED}{BC} = \frac{AD}{AC}$ $\therefore \frac{5}{15} = \frac{4}{AC}$

$\therefore AC = \frac{4 \times 15}{5} = 12$ cm.

$\therefore DC = 12 - 4 = 8$ cm. (The req.)

4

[a] In ΔABC : $\because m(\angle BAC) = 90°$, $\overline{AD} \perp \overline{BC}$

$\therefore (AB)^2 = BD \times BC = 16 \times 25 = 400$

$\therefore AB = 20$ cm.

, $(AC)^2 = CD \times BC = 9 \times 25 = 225$

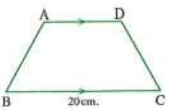
$\therefore AC = 15$ cm.

, $(AD)^2 = CD \times BD = 9 \times 16 = 144$

$\therefore AD = 12$ cm. (The req.)

[b] $\because BC = 2\,AD = 20$ cm.

$\therefore AD = 10$ cm.



, $\because$ the area of the trapezium ABCD $= \frac{1}{2}(BC + AD) \times$ the height

$\therefore 180 = \frac{1}{2}(20 + 10) \times$ the height

$\therefore 180 = 15 \times$ the height

$\therefore$ The height $= \frac{180}{15} = 12$ cm. (The req.)

5

[a] $\because \overline{AO} \perp \overleftrightarrow{BC}$

$\therefore$ The area of $\Delta ABC = \frac{1}{2} \times BC \times AO$

$= \frac{1}{2} \times 7 \times 5 = 17.5$ cm^2.

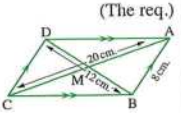
, $\because \overline{BE} \perp \overline{AC}$

$\therefore$ The area of $\Delta ABC = \frac{1}{2} \times AC \times BE = 17.5$

$\therefore \frac{1}{2} \times 10 \times BE = 17.5$ $\therefore 5\,BE = 17.5$

$\therefore BE = \frac{17.5}{5} = 3.5$ cm. (The req.)

[b] Let $\overline{AC} \cap \overline{BD} = \{M\}$



$\therefore AM = 10$ cm.

, $BM = 6$ cm.

$\therefore$ In ΔABM : $(AM)^2 = (10)^2 = 100$

, $(AB)^2 + (BM)^2 = (8)^2 + (6)^2 = 100$

$\therefore (AM)^2 = (AB)^2 + (BM)^2$

$\therefore \Delta ABM$ is right-angled at B

$\therefore m(\angle ABD) = 90°$ (First req.)

$\therefore$ The area of $\square ABCD$

$= AB \times BD = 8 \times 12 = 96$ cm^2. (Second req.)

10 El-Dakahlia

1 [1] (a) [2] (b) [3] (c)
[4] (a) [5] (c)

2 [1] congruent [2] 6 [3] >
[4] 80° [5] an obtuse-angled

3

[a] $\because \Delta EBC$, $\square ABCD$ have a common base $\overline{BC}$

, $E \in \overline{AD}$

$\therefore$ The area of $\Delta EBC = \frac{1}{2}$ the area of $\square ABCD$

but the area of $\square ABCD$ = the area of $\parallel$gm ABYX

(have a common base $\overline{AB}$ and between two parallel straight lines $\overleftrightarrow{AB}$, $\overleftrightarrow{CX}$)

$\therefore$ The area of $\Delta EBC = \frac{1}{2}$ the area of $\parallel$gm ABYX

(Q.E.D.)

[b] In ΔABC :

$\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (3)^2 + (4)^2 = 25$

$\therefore AC = 5$ cm.

In ΔACD :

$\because (AD)^2 = (13)^2 = 169$

, $(AC)^2 + (CD)^2 = (5)^2 + (12)^2 = 169$

, $\because (AD)^2 = (AC)^2 + (CD)^2$

$\therefore m(\angle ACD) = 90°$ (Q.E.D.)

4

[a] In $\Delta\Delta AXY$, ABC :

$\because \overline{XY} \parallel \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

$\therefore m(\angle AXY) = m(\angle B)$ (corresponding angles) (1)

, $\because \overline{XY} \parallel \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

$\therefore m(\angle AYX) = m(\angle C)$ (corresponding angles) (2)

, $\because \angle A$ is a common angle (3)

From (1) , (2) and (3) :

$\therefore \Delta AXY \sim \Delta ABC$ (First req.)

, $\frac{AX}{AB} = \frac{XY}{BC} = \frac{AY}{AC}$ $\therefore \frac{8}{12} = \frac{6}{BC}$

$\therefore BC = \frac{6 \times 12}{8} = 9$ cm. (Second req.)

[b] ∵ The area of Δ ACD = the area of Δ ABE

Subtracting the area of Δ ADE from both sides

∴ The area of Δ CED = the area of Δ BDE

and they have a common base $\overline{DE}$ and on one side of it

∴ $\overline{DE} // \overline{BC}$ (Q.E.D.)

5

[a] In Δ ABC :

∵ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

∴ $(AB)^2 = BD \times BC = 9 \times 25 = 225$

∴ AB = 15 cm.

, $(AD)^2 = DB \times DC = 9 \times 16 = 144$

∴ AD = 12 cm. (The req.)

[b] The area = $\left(\frac{8+10}{2}\right) \times 6 = 54$ cm.^{2}

11 Ismailia

1 [1] (b) [2] (c) [3] (b) [4] (b) [5] (b)

2 [1] 90° [2] double [3] (0 , 4) [4] equal in length [5] 35

3

[a] ∵ ΔΔ ADB , ADC have the same base $\overline{AD}$

, $\overline{BC} // \overline{AD}$

∴ The area of Δ ADB = the area of Δ ADC

Subtracting the area of Δ AMD from both sides

∴ The area of Δ ABM = the area of Δ DMC (1)

, ∵ $\overline{MD}$ is a median in Δ EMC

∴ The area of Δ DME = the area of Δ DMC (2)

From (1) and (2) :

∴ The area of Δ ABM = the area of Δ DME

(Q.E.D.)

[b] In Δ ABC : ∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (3)^2 + (4)^2 = 25$

∴ AC = 5 cm.

, in Δ ACD :

∵ $(AD)^2 = (13)^2 = 169$

, $(AC)^2 + (CD)^2 = (5)^2 + (12)^2 = 169$

∴ $(AD)^2 = (AC)^2 + (CD)^2$

∴ m (∠ ACD) = 90° (Q.E.D.)

4

[a] The area = $\left(\frac{8+10}{2}\right) \times 6 = 54$ cm.^{2}

[b] In ΔΔ ABE , CDE :

∵ $\overline{AB} // \overline{CD}$, $\overleftrightarrow{AC}$ is a transversal

∴ m (∠ A) = m (∠ C) (alternate angles) (1)

, ∵ $\overline{AB} // \overline{CD}$, $\overleftrightarrow{BD}$ is a transversal

∴ m (∠ B) = m (∠ D) (alternate angles) (2)

, m (∠ AEB) = m (∠ DEC) (V.O.A.) (3)

From (1) , (2) and (3) :

∴ Δ ABE ~ Δ CDE (First req.)

, $\frac{AB}{CD} = \frac{BE}{DE} = \frac{AE}{CE}$ ∴ $\frac{3}{DE} = \frac{4}{6}$

∴ DE = $\frac{3 \times 6}{4} = 4.5$ cm. (Second req.)

5

[a] ∵ The area of the figure ABCD = the area of the figure ABCE

Subtracting the area of Δ ABC from both sides

∴ The area of Δ ACD = the area of Δ ACE

and they have a common base $\overline{AC}$ and on one side of it

∴ $\overline{AC} // \overline{ED}$ (Q.E.D.)

[b] In Δ ABC :

∵ m (∠ ABC) = 90° , $\overline{BD} \perp \overline{AC}$

∴ BD = $\frac{BA \times BC}{AC} = \frac{6 \times 8}{10} = 4.8$ cm.

, ∵ $(BC)^2 = CD \times AC$

∴ $(8)^2 = CD \times 10$

∴ CD = $\frac{64}{10} = 6.4$ cm. (The req.)

12 Suez

1 [1] (c) [2] (c) [3] (b) [4] (b) [5] (a)

2 [1] 100° [2] 10 [3] proportional [4] B [5] lying on one of two parallel straight lines including them.

3

[a] [1] 6 [2] 12

[b] ∵ ΔΔ ADB , ADC have the same base $\overline{AD}$

, $\overline{AD} // \overline{BC}$

∴ The area of Δ ADB = the area of Δ ADC

Subtracting the area of Δ AMD from both sides

∴ The area of Δ AMB = the area of Δ DMC (1)

, ∵ $\overline{MD}$ is a median in Δ EMC

∴ The area of Δ MDE = the area of Δ DMC (2)

From (1) and (2) :

∴ The area of Δ AMB = the area of Δ DME

(Q.E.D.)

4

[a] ∵ The area of Δ AMB = the area of Δ DMC

Adding the area of Δ DMA to both sides

∴ The area of Δ ABD = the area of Δ ACD

and they have a common base $\overline{AD}$ and on one side of it

∴ $\overline{AD} // \overline{BC}$ (Q.E.D.)

[b] In ΔΔ ADE , ABC :

∵ $\overline{ED} // \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

∴ m (∠ ADE) = m (∠ B) (corresponding angles) (1)

, ∵ $\overline{ED} // \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

∴ m (∠ AED) = m (∠ C) (corresponding angles) (2)

, ∵ ∠ A is a common angle (3)

From (1) , (2) and (3) :

∴ Δ ADE ~ Δ ABC (First req.)

, $\frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$ ∴ $\frac{8}{BC} = \frac{6}{18}$

∴ BC = $\frac{18 \times 8}{6}$ = 24 cm. (Second req.)

5

[a] In Δ ABC :

∵ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

∴ $(AB)^2$ = BD × BC = 9 × 25 = 225

∴ AB = 15 cm.

, $(AD)^2$ = DB × DC = 9 × 16 = 144

∴ AD = 12 cm.

, $(AC)^2$ = CD × CB = 16 × 25 = 400

∴ AC = 20 cm. (The req.)

[b] In Δ BCD :

∵ m (∠ C) = 90°

∴ $(BD)^2 = (BC)^2 + (CD)^2 = (7)^2 + (24)^2 = 625$

∴ BD = 25 cm. (First req.)

, in Δ ABD :

∵ $(BD)^2 = (25)^2 = 625$

, $(AB)^2 + (AD)^2 = (15)^2 + (20)^2 = 625$

∴ $(BD)^2 = (AB)^2 + (AD)^2$

∴ m (∠ BAD) = 90° (Second req.)

, ∵ $\overline{AE} \perp \overline{BD}$

∴ AE = $\frac{AB \times AD}{BD} = \frac{15 \times 20}{25}$ = 12 cm. (Third req.)

13 Damietta

1 [1] (b) [2] (b) [3] (b) [4] (d) [5] (d)

2 [1] the base length [2] 3 : 4 [3] C [4] 70° [5] 2

3

[a] In ΔΔ ABC , ADE :

∵ $\overline{ED} // \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

∴ m (∠ B) = m (∠ ADE) (corresponding angles) (1)

, ∵ $\overline{ED} // \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

∴ m (∠ C) = m (∠ AED) (corresponding angles) (2)

, ∠ A is a common angle (3)

From (1) , (2) and (3) :

∴ Δ ABC ~ Δ ADE (First req.)

, $\frac{AB}{AD} = \frac{BC}{DE} = \frac{AC}{AE}$ ∴ $\frac{BC}{8} = \frac{21}{9}$

∴ BC = $\frac{8 \times 21}{9} = 18\frac{2}{3}$ cm. (Second req.)

[b] ∵ The area of Δ AEB = The area of Δ DEC

Adding the area of Δ AED to both sides

∴ The area of Δ ABD = the area of Δ ACD

and they have a common base $\overline{AD}$ and on one side of it.

∴ $\overline{AD} // \overline{BC}$ (Q.E.D.)

4

[a] ∵ ΔΔ ABC , DBC have a common base $\overline{BC}$

, $\overline{AD} // \overline{BC}$

∴ The area of Δ ABC = the area of Δ DBC

Subtracting the area of Δ MBC from both sides.

∴ The area of Δ ABM = the area of Δ DCM (1)

, ∵ $\overline{MX}$ is a median in the Δ MBC

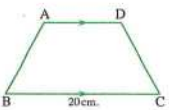
∴ The area of Δ BMX = the area of Δ CMX (2)

Adding (1) and (2) :

∴ The area of the figure ABXM = the area of the figure DCXM (Q.E.D.)

[b] ∵ BC = 2 AD = 20 cm.

∴ AD = 10 cm.



, ∵ the area of the trapezium ABCD $= \frac{1}{2}$ (BC + AD) × the height

∴ $180 = \frac{1}{2}$ (20 + 10) × the height

∴ 180 = 15 × the height

∴ The height $= \frac{180}{15} = 12$ cm. (The req.)

5

[a] In Δ ABC :

∵ m (∠ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$

∴ $(AD)^2 = DB \times DC = 9 \times 16 = 144$

∴ AD = 12 cm.

, $(AB)^2 = BD \times BC = 9 \times 25 = 225$

∴ AB = 15 cm.

, $(AC)^2 = CD \times BC = 16 \times 25 = 400$

∴ AC = 20 cm. (The req.)

[b] In Δ ABC :

∵ $(AC)^2 = (9)^2 = 81$

, $(AB)^2 + (BC)^2 = (7)^2 + (6)^2 = 85$

∴ $(AC)^2 < (AB)^2 + (BC)^2$

∴ Δ ABC is an acute-angled triangle. (The req.)

14 El-Fayoum

1 [1] (d) [2] (b) [3] (d)
[4] (c) [5] (b)

2 [1] proportional , equal in measure
[2] B
[3] equal in area [4] 5 [5] BC

3

[a] ∵ Δ ADC is right-angled at D

∴ $(AC)^2 = (AD)^2 + (DC)^2 = (4)^2 + (8)^2 = 80$

, ∵ Δ ADB is a right-angled at D

∴ $(AB)^2 = (AD)^2 + (BD)^2 = (4)^2 + (2)^2 = 20$

In Δ ABC :

∵ $(AC)^2 + (AB)^2 = 80 + 20 = 100$

, $(BC)^2 = (10)^2 = 100$

∴ $(BC)^2 = (AC)^2 + (AB)^2$

∴ m (∠ BAC) = 90° (Q.E.D.)

[b] ∵ Δ XYZ ~ Δ RYX

∴ m (∠ YXZ) = m (∠ YRX) = 90°

∴ $\overline{XR} \perp \overline{YZ}$ (First req.)

In Δ XYZ : ∵ m (∠ YXZ) = 90°

∴ $(YZ)^2 = (XY)^2 + (XZ)^2 = 6^2 + 8^2 = 100$

∴ YZ = 10 cm. , ∵ $\overline{XR} \perp \overline{YZ}$

, $(XZ)^2 = RZ \times YZ$

∴ $8^2 = RZ \times 10$

∴ $RZ = \frac{64}{10} = 6.4$ (Second req.)

4

[a] ∵ ABCD is a rectangle

∴ $\overleftrightarrow{AB} // \overleftrightarrow{CD}$

, ∵ M ∈ $\overleftrightarrow{AB}$, N ∈ $\overleftrightarrow{AB}$

∴ $\overline{MN} // \overline{DC}$

, ∵ $\overline{CN} // \overline{DM}$

∴ MNCD is a parallelogram

, ∵ the rectangle ABCD and the parallelogram MNCD have the common base $\overline{CD}$

, ∵ $\overleftrightarrow{AB} // \overline{CD}$

∴ The area of ▱ MNCD = the area of □ ABCD $= 18 \times 5 = 90$ cm^2. (First req.)

∴ The length of the perpendicular from M to $\overline{CN}$ $= \frac{\text{The area of ▱ MNCD}}{CN} = \frac{90}{20} = 4.5$ cm. (Second req.)

[b] ∵ ΔΔ ABD , ACD have a common base $\overline{AD}$

, $\overline{AD} // \overline{BC}$

∴ The area of Δ ABD = the area of Δ ACD

Subtracting the area of Δ AMD from both sides

∴ The area of Δ AMB = the area of Δ DMC

(Q.E.D.)

5

[a] ∵ $\overline{MN}$ is a median in Δ BCM

∴ The area of Δ BMN = the area of Δ CMN (1)

, ∵ the area of the figure ABNM = the area of the figure DCNM (2)

Subtracting (1) from (2) :

∴ The area of Δ ABM = the area of Δ DCM

and the lengths of their bases are equal and on the same straight line and the two triangles are on the same side of the straight line.

∴ $\overline{CB} \parallel \overline{DA}$ (Q.E.D.)

[b] In ΔΔ ABC , AOL :

∵ $\overline{BC} \parallel \overline{OL}$, $\overleftrightarrow{AB}$ is a transversal

∴ m (∠ B) = m (∠ AOL) (corresponding angles) (1)

, ∵ $\overline{BC} \parallel \overline{OL}$, $\overrightarrow{AC}$ is a transversal

∴ m (∠ C) = m (∠ ALO) (corresponding angles) (2)

, ∠ A is a common angle (3)

From (1) , (2) and (3) :

∴ Δ ABC ~ Δ AOL (First req.)

, $\frac{AB}{AO} = \frac{BC}{OL} = \frac{AC}{AL}$ ∴ $\frac{6}{4} = \frac{7.5}{OL} = \frac{AC}{6}$

∴ $AC = \frac{6 \times 6}{4} = 9$ cm.

∴ CL = 9 – 6 = 3 cm.

, $OL = \frac{4 \times 7.5}{6} = 5$ cm. (Second req.)

15 Aswan

1 [1] (b) [2] (d) [3] (a) [4] (c) [5] (b)

2 [1] B [2] BC [3] 120° [4] 10 [5] 154

3

[a] ∵ ABCD is a parallelogram

∴ $\overline{AB} \parallel \overline{CD}$ ∴ $\overleftrightarrow{BE} \parallel \overline{CD}$ (1)

, ∵ the area of Δ AME = the area of Δ ABC

Subtracting the area of Δ AMB from both sides

∴ The area of Δ MBE = the area of Δ MBC

and they have a common base $\overline{MB}$ and on one side of it

∴ $\overline{CE} \parallel \overleftrightarrow{BD}$ (2)

From (1) and (2) :

∴ The figure BECD is a parallelogram. (Q.E.D.)

[b] ∵ Δ ADC is right-angled at D

∴ $(AC)^2 = (AD)^2 + (DC)^2 = (4)^2 + (8)^2 = 80$

, ∵ Δ ADB is right-angled at D

∴ $(AB)^2 = (AD)^2 + (BD)^2 = (4)^2 + (2)^2 = 20$

In Δ ABC :

∵ $(AC)^2 + (AB)^2 = 8 + 20 = 100$

, $(BC)^2 = (10)^2 = 100$

∴ $(BC)^2 = (AC)^2 + (AB)^2$

∴ m (∠ BAC) = 90° (Q.E.D.)

4

[a] ∵ Δ ABF has a common base $\overline{AB}$ with ▱ ABCD , $F \in \overline{DC}$

∴ The area of Δ ABF = $\frac{1}{2}$ the area of ▱ ABCD

∴ The area of Δ ADF + the area of Δ FBC = $\frac{1}{2}$ the area of ▱ ABCD (1)

∵ Δ EBC has a common base $\overline{BC}$ with ▱ ABCD , $E \in \overleftrightarrow{AD}$

∴ The area of Δ EBC = $\frac{1}{2}$ the area of ▱ ABCD (2)

From (1) and (2)

∴ The area of Δ ADF + the area of Δ FBC = the area of Δ EBC

Subtracting the area of Δ FBC from both sides

∴ The area of Δ AFD = the area of Δ EFC

(Q.E.D.)

[b] In Δ XYZ :

∵ $(YZ)^2 = (11)^2 = 121$

, $(XY)^2 + (XZ)^2 = (8)^2 + (6)^2 = 100$

∴ $(YZ)^2 > (XY)^2 + (XZ)^2$

∴ Δ XYZ is an obtuse-angled triangle. (The req.)

5

[a] In $\Delta\Delta$ ABC , EBD :

$\because \overline{AC} // \overline{DE}$, $\overleftrightarrow{AE}$ is a transversal

$\therefore$ m ($\angle$ A) = m ($\angle$ E) (alternate angles) (1)

, $\because \overline{AC} // \overline{DE}$, $\overleftrightarrow{CD}$ is a transversal

$\therefore$ m ($\angle$ C) = m ($\angle$ D) (alternate angles) (2)

, $\because$ m ($\angle$ ABC) = m ($\angle$ DBE) (V.O.A.) (3)

From (1) , (2) and (3) :

$\therefore \Delta$ ABC ~ Δ EBD (First req.)

, $\frac{AB}{BE} = \frac{BC}{BD} = \frac{AC}{DE}$ $\therefore \frac{3}{BE} = \frac{4}{8}$

$\therefore BE = \frac{8 \times 3}{4} = 6$ cm. (Second req.)

[b] $\because \Delta\Delta$ ABD , ABC have a common base $\overline{AB}$, $\overline{AB} // \overline{CD}$

$\therefore$ The area of Δ ABD = the area of Δ ABC

Subtracting the area of Δ ABM from both sides.

$\therefore$ The area of Δ AMD = the area of Δ BMC

But the area of Δ AMD = the area of Δ MCE

$\therefore$ The area of Δ BMC = the area of Δ MCE

and they have a common base $\overline{CM}$ and on one side of it

$\therefore \overline{MC} // \overline{BE}$ (Q.E.D.)

2022

Schools Examinations of the previous years on Geometry

1 Cairo Governorate

Heliopolis Directorate
Kalousdian-Nubarian Armenian School

Answer the following questions :

1 Choose the correct answer :

1 The area of the triangle is ..... the area of the parallelogram which has a common base and its vertex lies on the straight line parallel to this base.

(a) equal to (b) half (c) twice (d) quarter

2 If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) ≤

3 In Δ ABC , if $(AC)^2 > (AB)^2 + (BC)^2$, then the angle B is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

4 The height of the triangle whose area is 24 cm^2 and its corresponding base length is 8 cm. equals ..... cm.

(a) 3 (b) 4 (c) 6 (d) 8

5 If the ratio of enlargement between two triangles equals 1 , then the two triangles are .....

(a) congruent. (b) enlargement. (c) coincide. (d) reduction.

6 A rhombus its two diagonals are of lengths 8 cm. and 6 cm. , its area equals ..... cm^2

(a) 14 (b) 20 (c) 24 (d) 48

2 Complete each of the following :

1 The median of a triangle divides its surface into two triangles .....

2 If the point A ∈ the straight line L , then the projection of the point A on this straight line is .....

3 If two triangles are similar , then the lengths of their corresponding sides are .....

4 If the area of a trapezium is 75 cm^2 and the length of its middle base is 15 cm. , then its height is ..... cm.

5 If Δ ABC ~ Δ XYZ , AB = 5 cm. , XY = 10 cm. and YZ = 8 cm. , then BC = ... cm.

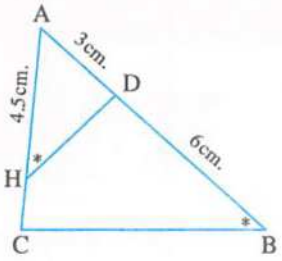
3 **[a] In the opposite figure :**

$m(\angle AHD) = m(\angle B)$

, $AD = 3$ cm. , $AH = 4.5$ cm. and $BD = 6$ cm.

1 **Prove that :** $\Delta ADH \sim \Delta ACB$

2 **Find :** the length of $\overline{HC}$



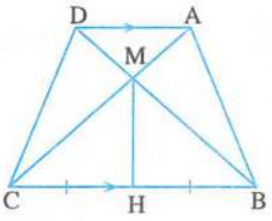
[b] In the opposite figure :

$\overline{AD} // \overline{BC}$, H is the midpoint of $\overline{BC}$

Prove that :

1 The area of ΔAMB = the area of ΔDMC

2 The area of the figure ABHM = the area of the figure DCHM



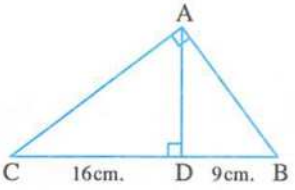
4 **[a] In the opposite figure :**

$m(\angle BAC) = 90°$, $\overline{AD} \perp \overline{BC}$

, $BD = 9$ cm. , $DC = 16$ cm.

1 **Find :** the length of $\overline{AB}$

2 **Find :** the length of the projection of $\overline{AC}$ on $\overleftrightarrow{AD}$



[b] A trapezium , its area is 6 cm^2 , the length of one of its two parallel bases equals 5 cm. and its height is 7 cm. Find the length of the other base.

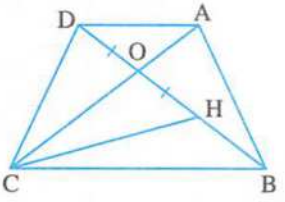
5 **[a] In the opposite figure :**

ABCD is a quadrilateral its diagonals intersect at the point O

, $H \in \overline{BO}$ where $OH = OD$

, the area of ΔABO = the area of ΔHOC

Prove that : $\overline{AD} // \overline{BC}$



[b] Identify the type of ΔABC according to the measures of its angles where $AB = 5$ cm. , $BC = 6$ cm. , $AC = 7$ cm.

2 Cairo Governorate

El-Nozha Directorate of Education
Modern Language Schools

Answer the following questions :

1 **Choose the correct answer :**

1 The area of the trapezium whose middle base is of length 7 cm. and its height is 6 cm. equals .....

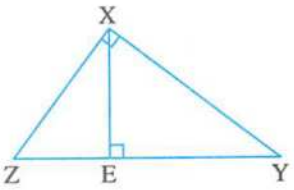
(a) 21 cm^2 (b) 40 cm^2 (c) 42 cm^2 (d) 13 cm^2

2 In ΔABC , if $m(\angle C) = 90°$, $AB = 20$ cm. and $BC = 16$ cm.
, then $AC =$ ..... cm.

(a) 9 (b) 12 (c) $4\sqrt{41}$ (d) 25

3 **In the opposite figure :**

$EY \times EZ =$ .....



(a) $(XE)^2$ (b) $(XZ)^2$

(c) $(YZ)^2$ (d) $(XY)^2$

4 The triangle whose sides lengths are 5 cm. , 8 cm. and 7 cm. is .....-angled triangle.

(a) a right (b) an acute (c) an obtuse (d) a straight

5 If the triangle base length is 6 cm. and its area is 24 cm^2
, then its corresponding height is .....

(a) 18 cm. (b) 8 cm. (c) 4 cm. (d) 10 cm.

6 If $\overline{AB} \parallel \overline{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) ≥

2 Complete :

1 The two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

2 If $\Delta ABC \sim \Delta XYZ$, $m(\angle A) + m(\angle B) = 60°$, then $m(\angle Z) =$ .....°

3 If ΔABC is an obtuse-angled triangle at B , then $(AC)^2$ ..... $(AB)^2 + (BC)^2$

4 If the length of the diagonal of a square is 10 cm. , then its area = ... cm^2

5 If the ratio between the lengths of two corresponding sides of two similar polygons is 2 : 5 and the perimeter of the smaller one is 12 cm. , then the perimeter of the other one is .....

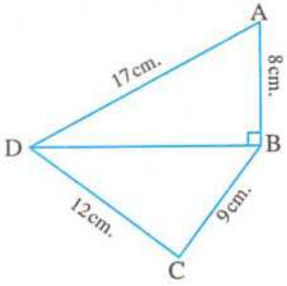
3 [a] In the opposite figure :

ABCD is a quadrilateral in which :

$AB = 8$ cm. , $BC = 9$ cm.

, $CD = 12$ cm. , $AD = 17$ cm.

and $\overline{DB} \perp \overline{AB}$



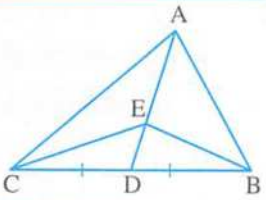
1 **Find :** the length of $\overline{BD}$

2 **Prove that :** $m(\angle C) = 90°$

[b] In the opposite figure :

ABC is a triangle with a median $\overline{AD}$, $E \in \overline{AD}$

Prove that : the area of ΔABE = the area of ΔACE

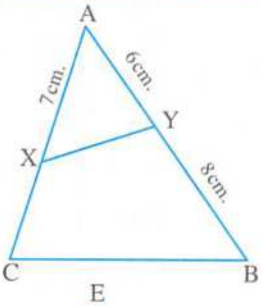


4 [a] In the opposite figure :

$\Delta AXY \sim \Delta ABC$, AX = 7 cm.

, AY = 6 cm. , YB = 8 cm.

Find : the length of $\overline{XC}$

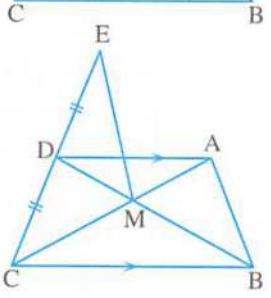


[b] In the opposite figure :

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, D is the midpoint of $\overline{EC}$

Prove that : the area of ΔMDE = the area of ΔAMB



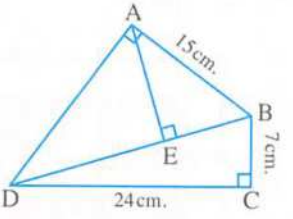
5 In the opposite figure :

ABCD is a quadrilateral , m (∠ BCD) = m (∠ BAD) = 90°

, $\overline{AE} \perp \overleftrightarrow{BD}$

1 **Find :** the length of each of $\overline{BD}$ and $\overline{AD}$

2 **Find :** the length of the projection of $\overline{AB}$ on $\overleftrightarrow{BD}$



3 Cairo Governorate

El Zawia Educational Zone
Geel Almostakbal E.L.S.

Answer the following questions :

1 Complete each of the following :

1 The diagonal length of a square whose area is 50 cm^2 equals .....

2 The lengths of two adjacent sides in a parallelogram are 9 cm. , 6 cm. and the smallest height is 4 cm. , then the length of the other height is .....

3 The two polygons similar to a third are .....

4 The median of a triangle divides it into two triangles ..... in area.

5 The area of the trapezium whose parallel bases are of lengths 6 cm. , 10 cm. and its height is 5 cm. equals .....

2 Choose the correct answer :

1 If the area of a rhombus is 24 cm^2 and the length of one of its diagonals is 6 cm. , then the length of the other diagonal is .....

(a) 4 cm. (b) 8 cm. (c) 10 cm. (d) 12 cm.

2 The length of the projection of a given line segment ..... the length of the original line segment.

(a) $\geq$ (b) $>$ (c) $\leq$ (d) $=$

3 ABC is an obtuse-angled triangle at A in which AB = 5 cm. , BC = 8 cm. , then AC = ... cm.

(a) 5 (b) 7 (c) 8 (d) 13

4 ABC is a triangle in which $(AB)^2 = (AC)^2 + (BC)^2$, m ($\angle$ B) = 40° , then m ($\angle$ A) = ...

(a) 40° (b) 50° (c) 90° (d) 130°

5 The diagonals of an isosceles trapezium are .....

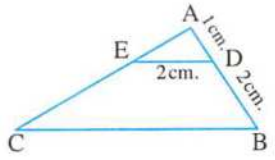
(a) congruent. (b) perpendicular. (c) bisecting each other. (d) parallel.

6 **In the opposite figure :**

If $\Delta ADE \sim \Delta ABC$

, then the length of

$\overline{BC}$ in cm. equals ..... cm.



(a) 3 (b) 4 (c) 6 (d) 8

3 [a] In the opposite figure :

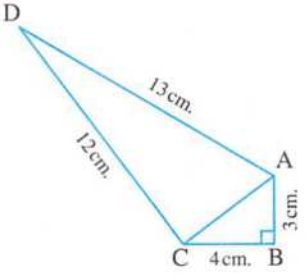
AB = 3 cm. , BC = 4 cm.

, AD = 13 cm. , CD = 12 cm.

, m ($\angle$ B) = 90°

Prove that :

m ($\angle$ ACD) = 90°

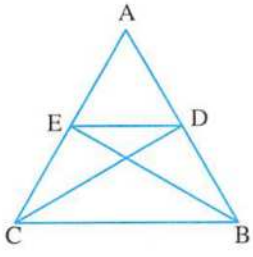


[b] In the opposite figure :

If the area of ΔADC = the area of ΔAEB

Prove that :

$\overline{DE} \parallel \overline{BC}$

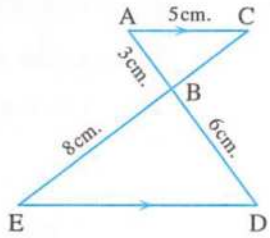


4 **[a] In the opposite figure :**

$\overline{AC} \parallel \overline{DE}$

, $\overline{AD} \cap \overline{CE} = \{B\}$

, AB = 3 cm. , AC = 5 cm. , BD = 6 cm. , EB = 8 cm.



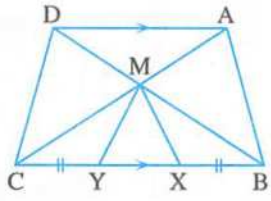
1 **Prove that :** $\Delta ABC \sim \Delta DBE$

2 **Find the length of each of :** $\overline{BC}$, $\overline{DE}$

[b] In the opposite figure :

$\overline{AD} \parallel \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, $X \in \overline{BC}$, $Y \in \overline{BC}$ such that BX = CY



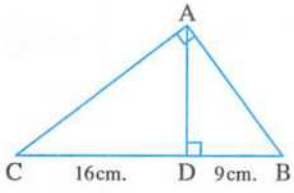
Prove that :

The area of the shape ABXM = the area of the shape DCYM

5 **In the opposite figure :**

ABC is a right-angled triangle at A

, $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm. **Find :**



1 The length of $\overline{AB}$

2 The length of the projection of $\overline{AC}$ on $\overleftrightarrow{AD}$

3 The area of ΔABC

4 Giza Governorate — Math Inspection

Answer the following questions :

1 **Complete each of the following :**

1 A square its diagonal length = 12 cm. , then its area = ... cm^2.

2 If $\overline{AB} \perp \overleftrightarrow{CD}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$ equals .....

3 The two polygons are similar if their corresponding angles are ..... and their corresponding sides are .....

4 The area of a triangle is equal to half of the area of a parallelogram if they have a common base and .....

5 ABC is a triangle , AB = 8 cm. , BC = 9 cm. and AC = 6 cm. , then its type according to its angles is .....

2 Choose the correct answer :

1 The area of a parallelogram = 24 cm^2 and its base length is 6 cm. , then its corresponding height = ... cm.

(a) 8 (b) 4 (c) 48 (d) 12

2 The median of a triangle divides its surface into two triangles .....

(a) similar. (b) congruent. (c) equal in area. (d) equal in perimeter.

3 In ΔABC , if $(AC)^2 < (AB)^2 + (BC)^2$, then the type of $\angle B$ is .....

(a) obtuse. (b) right. (c) acute. (d) straight.

4 The trapezium whose middle base length = 9 cm. and its height = 6 cm. , its area = ... cm^2

(a) 27 (b) 54 (c) 15 (d) 108

5 $\overline{AB} \parallel \overleftrightarrow{CD}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$ ..... the length of $\overline{AB}$

(a) > (b) < (c) = (d) ≤

6 A rhombus whose diagonal lengths are 12 cm. , 8 cm. its area = ... cm^2

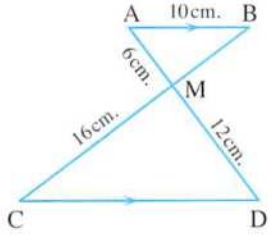
(a) 48 (b) 96 (c) 20 (d) 144

3 [a] In the opposite figure :

$\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cap \overline{BC} = \{M\}$

, AB = 10 cm. , AM = 6 cm.

, MD = 12 cm. , MC = 16 cm.



1 **Prove that :** $\Delta AMB \sim \Delta DMC$

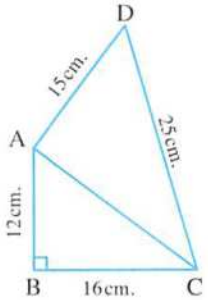
2 **Find :** the length of $\overline{CD}$

[b] Find the height of the trapezium whose area = 450 cm^2 and the two base lengths are 24 cm. , 12 cm.

4 [a] In the opposite figure :

ABCD is a quadrilateral , $m(\angle B) = 90°$, AB = 12 cm.

, BC = 16 cm. , CD = 25 cm. and DA = 15 cm.



1 **Find :** AC

2 **Prove that :** $m(\angle DAC) = 90°$

[b] Determine the type of the triangle ABC according to its angles if AB = 12 cm. , BC = 5 cm. and AC = 13 cm.

, then find its area.

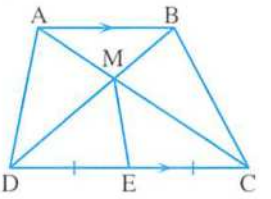
5 **[a] In the opposite figure :**

$\overline{AB} // \overline{DC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, E is the midpoint of $\overline{CD}$

Prove that : the area of the figure ADEM

= the area of the figure BCEM



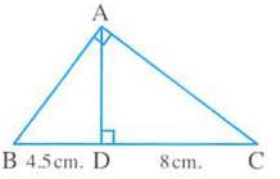
[b] In the opposite figure :

ABC is a triangle , m (∠ BAC) = 90°

, $\overline{AD} \perp \overline{BC}$

, BD = 4.5 cm. , DC = 8 cm.

Find : AD , AB , AC



5 Giza Governorate

Omrania Directorate
El-Sadat Governmental Language School

Answer the following questions :

1 **Choose the correct answer :**

1 In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then ∠ C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 A rhombus whose diagonal lengths are 6 cm. , 10 cm. its area = ... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

3 If the length of the middle base of a trapezium is 8 cm. and its surface area is 56 cm^2 , then its height = ... cm.

(a) 32 (b) 24 (c) 448 (d) 7

4 If the ratio of enlargement between two triangles equals 1 , then the two triangles are .....

(a) congruent. (b) enlargement. (c) coincide. (d) reduction.

5 Any triangle has at least two ..... angles.

(a) right (b) obtuse (c) acute (d) straight

6 The isosceles triangle has ..... axis of symmetry.

(a) zero (b) one (c) two (d) three

2 **Complete each of the following :**

1 The median of a triangle divides it into two triangles ..... in area.

2 Two triangles are similar if their corresponding side lengths are .....

3 ABCD is a rectangle , the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

4 The surfaces of two parallelograms with common base and between two parallel straight lines one is carrying this base are .....

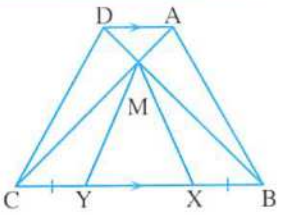
5 ABCD is a parallelogram its area = 36 cm^2 , $E \in \overline{AD}$, then the area of Δ EBC = ... cm^2

3 **[a] In the opposite figure :**

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, $X \in \overline{BC}$, $Y \in \overline{BC}$ such that BX = CY

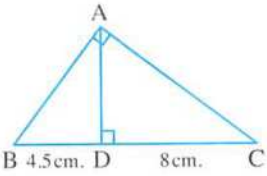
Prove that : the area of the shape ABXM = the area of the shape DCYM



[b] In the opposite figure :

ABC is a triangle in which : m ($\angle$ BAC) = 90° , $\overline{AD} \perp \overline{BC}$, BD = 4.5 cm. , DC = 8 cm.

Find : the length of each of $\overline{AC}$, $\overline{AB}$, $\overline{AD}$



4 **[a] In the opposite figure :**

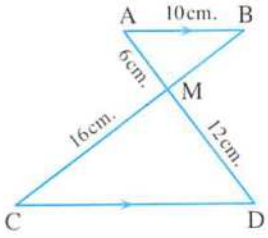
$\overline{AB} // \overline{DC}$, $\overline{AD} \cap \overline{BC} = \{M\}$

, AB = 10 cm. , AM = 6 cm.

, MD = 12 cm. , MC = 16 cm.

1 **Prove that :** Δ AMB ~ Δ DMC

2 **Find :** the length of each of $\overline{CD}$, $\overline{MB}$



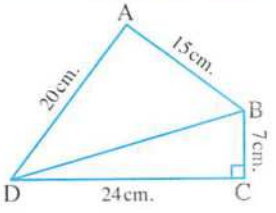
[b] Identify the type of Δ ABC according to the measures of its angles where AB = 5 cm. , BC = 6 cm. , AC = 7 cm.

5 **[a] In the opposite figure :**

m ($\angle$ BCD) = 90° , AB = 15 cm.

, BC = 7 cm. , CD = 24 cm. , AD = 20 cm.

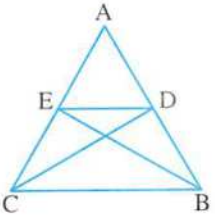
Prove that : m ($\angle$ BAD) = 90°



[b] In the opposite figure :

If the area of Δ ADC = the area of Δ AEB

, prove that : $\overline{DE} // \overline{BC}$



6 Giza Governorate

6th October Directorate
Om Al Moamneen Language School

Answer the following questions :

1 Choose the correct answer :

1 If the area of a parallelogram is 40 cm^2 and its base length is 5 cm. , then the corresponding height to this base is ..... cm.

(a) 16 (b) 8 (c) 20 (d) 5

2 A triangle ABC in which $(AC)^2 - (AB)^2 = (BC)^2$, then $\angle B$ is .....

(a) acute. (b) right. (c) reflex. (d) obtuse.

3 If the area of a square is 72 cm^2 , then its diagonal length is ..... cm.

(a) 6 (b) 8 (c) 36 (d) 12

4 ABC is a right-angled triangle at B , $\overline{BD} \perp \overline{AC}$, $D \in \overline{AC}$, then the projection of $\overline{BD}$ on $\overleftrightarrow{AC}$ is .....

(a) A (b) B (c) C (d) D

5 ABC is a triangle in which $(AB)^2 = (BC)^2 + (AC)^2$ and $m(\angle B) = 40°$, then $m(\angle A)$ = ...

(a) 40° (b) 50° (c) 90° (d) 130°

6 If $\overline{XL}$ is a median in ΔXYZ , then the area of ΔXYZ = ... the area of ΔXYL

(a) 2 (b) 4 (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

2 Complete each of the following :

1 If the ratio of enlargement between two triangles equals 1 , then the two triangles are .....

2 A trapezium whose base lengths are 8 cm. , 10 cm. , and its height is 5 cm. , then its area equals ..... cm^2

3 ABC is a right-angled triangle at A , $\overline{AD} \perp \overline{BC}$, $D \in \overline{BC}$, DC = 9 cm. , BD = 16 cm. , then the length of $\overline{AC}$ = ... cm.

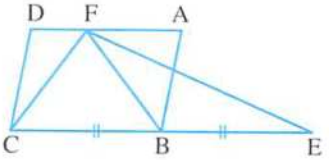
4 A triangle whose side lengths are 6 cm. , 8 cm. , 11 cm. , then its type according to its angles is .....

5 If ABC is a triangle , $m(\angle A) = 3x°$, $m(\angle B) = 5x°$, $m(\angle C) = 4x°$, then $m(\angle B)$ = ...°

3 [a] In the opposite figure :

ABCD is a parallelogram , $E \in \overleftrightarrow{CB}$, where BC = BE

Prove that : The area of ΔEFC = The area of $\square ABCD$



[b] In the opposite figure :

ABCD is a quadrilateral ,

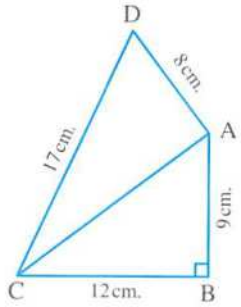
$m(\angle B) = 90°$

, AB = 9 cm.

, BC = 12 cm. , DA = 8 cm. , CD = 17 cm.

Prove that :

$m(\angle DAC) = 90°$



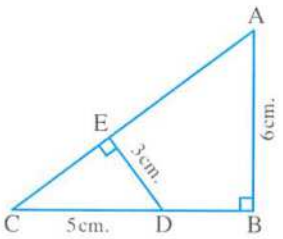
4 **[a] In the opposite figure :**

ABC is a right-angled triangle at B

, $\overline{ED} \perp \overline{AC}$, CD = 5 cm. , AB = 6 cm. , ED = 3 cm.

1 **Prove that :** $\Delta CED \sim \Delta CBA$

2 **Find :** The length of $\overline{AC}$



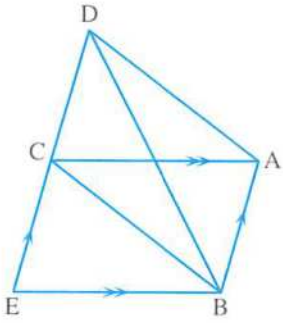
[b] In the opposite figure :

ABEC is a parallelogram

, $D \in \overrightarrow{EC}$

such that the area of ΔDBC = the area of ΔEBC

Prove that : $\overline{AD} // \overline{BC}$



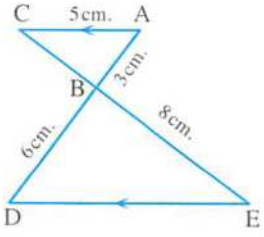
5 **[a] In the opposite figure :**

$\overline{AC} // \overline{ED}$, $\overline{AD} \cap \overline{CE} = \{B\}$, AC = 5 cm.

, AB = 3 cm. , BD = 6 cm. , BE = 8 cm.

1 **Prove that :** $\Delta ABC \sim \Delta DBE$

2 **Find :** The perimeter of the triangle BED



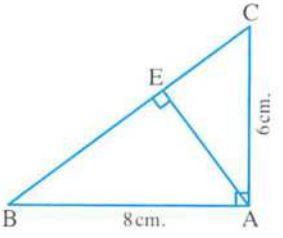
[b] In the opposite figure :

ABC is a triangle in which : $m(\angle BAC) = 90°$, $\overline{AE} \perp \overline{BC}$

Find :

1 The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$

2 The length of $\overline{EC}$



7 Alexandria Governorate

West Educational Zone
Inspectorate of Mathematics

Answer the following questions :

1 Complete each of the following :

1 The area of the rhombus whose diagonal lengths are 12 cm. , 8 cm. equals ..... cm^2

2 If $\overline{AD} \perp \overline{BC}$, then the length of the projection of $\overline{AD}$ on $\overleftrightarrow{BC}$ equals ..... cm.

3 ABC is a right-angled triangle at B in which AB = 5 cm. , BC = 12 cm. , then AC = ... cm.

4 In Δ ABC , AB = 8 cm. , BC = 9 cm. and AC = 6 cm. , then the type of this triangle according to the measures of its angles is .....

5 The number of axes of symmetry of an isosceles triangle equals .....

2 Choose the correct answer :

1 The diagonals of an isosceles trapezium are .....

(a) congruent. (b) perpendicular.

(c) bisecting each other. (d) parallel.

2 If the ratio between two corresponding sides of two similar triangles is 1 : 2 and the measure of an angle of the first triangle equals 60° , then the measure of its corresponding angle in the other triangle equals .....

(a) 30° (b) 120° (c) 60° (d) 62°

3 The image of the point (2 , 0) is itself by reflection on .....

(a) X-axis (b) y-axis

(c) origin point. (d) X-axis followed by y-axis

4 The perpendicular segment drawn from the right angle of a triangle to the hypotenuse divides it into two ..... triangles.

(a) obtuse-angled (b) acute-angled

(c) equilateral (d) similar

5 The measure of the complementary angle of an angle whose measure is $X°$ equals .....

(a) 90° (b) $90° - X°$ (c) $X° - 90°$ (d) $90\ X°$

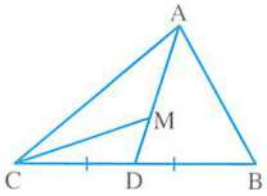
6 ABCD is a parallelogram , $E \in \overline{BC}$, then the area of $\square$ ABCD = ... the area of Δ EAD

(a) same (b) half (c) twice (d) third

3 **[a] In the opposite figure :**

ABC is a triangle , M is the point of concurrence of its medians.

Prove that : the area of Δ AMC = $\frac{1}{3}$ the area of Δ ABC

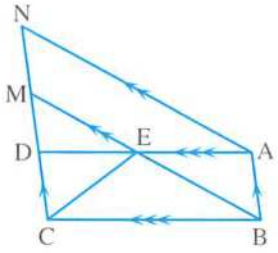


[b] In the opposite figure :

ABCD and ABMN are two parallelograms.

Prove that :

The area of Δ EBC = $\frac{1}{2}$ the area of $\square$ ABMN



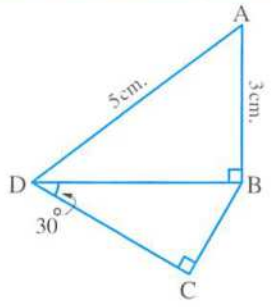
4 **[a] In the opposite figure :**

ABCD is a quadrilateral in which :

m ($\angle$ ABD) = 90° , m ($\angle$ BCD) = 90°

, m ($\angle$ BDC) = 30° , AB = 3 cm. , AD = 5 cm.

Find : the lengths of $\overline{BD}$ and $\overline{BC}$



[b] In the opposite figure :

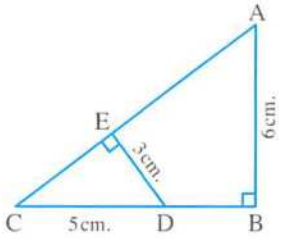
ABC is a right-angled triangle at B

, $\overline{DE} \perp \overline{AC}$, AB = 6 cm.

, ED = 3 cm. , CD = 5 cm.

1 **Prove that :** Δ ABC ~ Δ DEC

2 **Find :** the length of $\overline{AC}$



5 **[a]** The area of a trapezium is 88 cm^2 , its height is 8 cm. and the length of one of the two parallel bases is 10 cm. Find the length of the other base.

[b] In the opposite figure :

m ($\angle$ ABD) = 90° , $\overline{CE} \perp \overline{AB}$

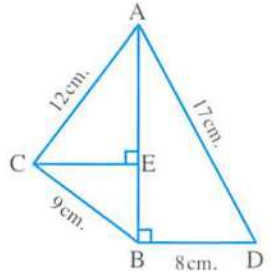
, CB = 9 cm. , AD = 17 cm.

, BD = 8 cm. , AC = 12 cm.

1 **Find :** the length of $\overline{AB}$

2 **Prove that :** m ($\angle$ ACB) = 90°

3 **Find :** the length of the projection of $\overline{AC}$ on $\overleftrightarrow{AB}$



Answer the following questions :

1 Choose the correct answer :

1 Any triangle has at least two ..... interior angles.

(a) right (b) obtuse (c) acute (d) straight

2 If the area of a trapezium is 100 cm^2 and its height is 5 cm. , then the length of its middle base is ..... cm.

(a) 20 (b) 30 (c) 50 (d) 40

3 ABCD is a parallelogram , $E \in \overline{BC}$, then the area of $\square$ ABCD = ... the area of Δ EAD

(a) same (b) half (c) twice (d) third

4 If Δ XYZ is an obtuse-angled triangle at Y , then $(XZ)^2$ ..... $(XY)^2 + (YZ)^2$

(a) < (b) > (c) = (d) ≥

5 ABCD is a square , then the projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ is .....

(a) $\overline{AB}$ (b) $\overline{BC}$ (c) $\overline{CD}$ (d) $\overline{AD}$

6 A rhombus whose diagonal lengths are 6 cm. , 10 cm. has area ..... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

2 Complete each of the following :

1 If two straight lines intersect , then each two vertically opposite angles are .....

2 In the triangle ABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then m (∠ .....) = 90°

3 Δ ABC ~ Δ XYZ , and m (∠ B) + m (∠ C) = 70° , then m (∠ X) = ...°

4 The number of axes of symmetry of the rectangle is .....

5 The ratio between the perimeters of two similar polygons is 3 : 5 , then the ratio between the lengths of two corresponding sides is .....

3 [a] In the opposite figure :

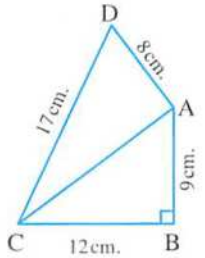
ABCD is a quadrilateral

, m (∠ B) = 90°

, AB = 9 cm. , BC = 12 cm.

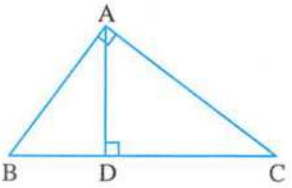
, CD = 17 cm. and DA = 8 cm.

Prove that : m (∠ DAC) = 90°



[b] In the opposite figure :

ABC is a triangle , m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

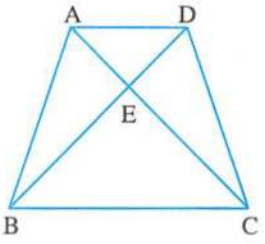


Then complete :

1 The projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ is .....

2 The projection of $\overline{AD}$ on $\overleftrightarrow{BC}$ is .....

4 [a] In the opposite figure :



The area of Δ AEB

= the area of Δ DEC

Prove that : $\overline{AD} // \overline{BC}$

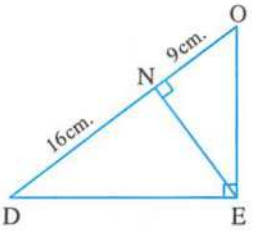
[b] In the opposite figure :

OED is a right-angled triangle at E

, $\overline{EN} \perp \overline{DO}$, DN = 16 cm.

and ON = 9 cm.

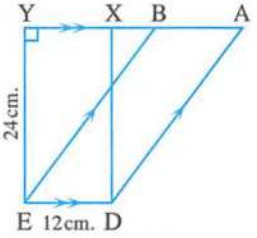
Find the length of each of : $\overline{EN}$, $\overline{EO}$, $\overline{ED}$



5 In the opposite figure :

$\overleftrightarrow{AB} // \overleftrightarrow{DE}$, X ∈ $\overleftrightarrow{AB}$ and Y ∈ $\overleftrightarrow{AB}$

, XDEY is a rectangle and $\overline{AD} // \overline{BE}$



1 **Prove that :** the area of figure ABED = the area of rectangle XYED

2 **Find :** the area of the figure ABED

3 If AD = 30 cm. , find the length of the perpendicular from B to $\overline{AD}$

9 El-Kalyoubia Governorate — Math's Inspection

Answer the following questions :

1 Choose the correct answer from those given :

1 The sum of measures of the interior angles of a triangle equals ..... °

(a) 90 (b) 180 (c) 80 (d) 360

2 The area of the rhombus whose diagonal lengths are 6 cm. and 8 cm. is ..... cm^2

(a) 7 (b) 24 (c) 48 (d) 14

3 ABCD is a parallelogram in which m (∠ A) = 120° , then m (∠ B) = ... °

(a) 120 (b) 60 (c) 90 (d) 180

4 If $\Delta ABC \equiv \Delta XYZ$ and $m(\angle X) = 70°$, then $m(\angle A) =$ ..... °

(a) 70 (b) 55 (c) 50 (d) 80

5 If $\Delta ABC \sim \Delta XYZ$, then $m(\angle B) = m(\angle$ .....)

(a) C (b) Z (c) X (d) Y

6 ABC is a triangle in which $(AB)^2 > (BC)^2 + (AC)^2$, then $\angle C$ is .....

(a) acute (b) right (c) obtuse (d) straight

2 Complete each of the following :

1 The area of the parallelogram = the length of the base × .....

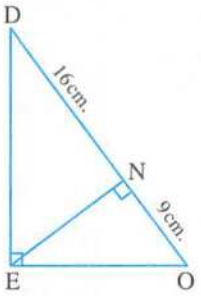
2 Two polygons are similar if .....

3 If the point A $\in$ the line L , then the projection of the point A on the line L is .....

4 In ΔABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then $m(\angle$ ..... $) = 90°$

5 The surfaces of two parallelograms with common base and between two parallel straight lines , one is carrying this base are .....

3 [a] In the opposite figure :



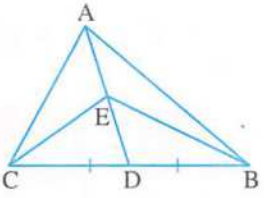
DEO is a right-angled triangle at E

, $\overline{EN} \perp \overline{DO}$, DN = 16 cm.

and ON = 9 cm.

Find the length of each of : $\overline{EN}$, $\overline{DE}$, $\overline{EO}$

[b] In the opposite figure :

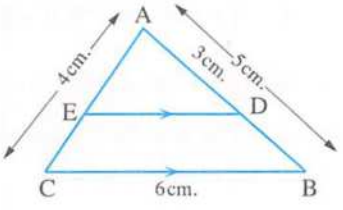


$\overline{AD}$ is a median in ΔABC , $E \in \overline{AD}$

and $\overline{BE}$, $\overline{CE}$ are drawn.

Prove that : the area of ΔABE = the area of ΔACE

4 [a] In the opposite figure :



ABC is a triangle in which AB = 5 cm.

, BC = 6 cm. , AC = 4 cm. and $D \in \overline{AB}$

where AD = 3 cm. , $\overline{DE} \parallel \overline{BC}$, $\overline{DE} \cap \overline{AC} = \{E\}$

1 **Prove that :** $\Delta ADE \sim \Delta ABC$

2 **Find the length of each of :** $\overline{DE}$ and $\overline{AE}$

[b] The area of a trapezium is 108 cm^2 and the length of one of its parallel bases is 15 cm. Find the length of the other base , if the height of the trapezium is 8 cm.

5 **[a] In the opposite figure :**

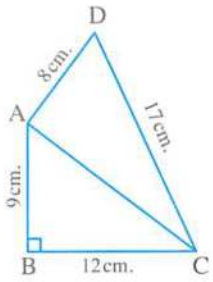
ABCD is a quadrilateral

, m (∠ B) = 90° , AB = 9 cm.

, BC = 12 cm. , CD = 17 cm.

and DA = 8 cm.

Prove that : m (∠ DAC) = 90°



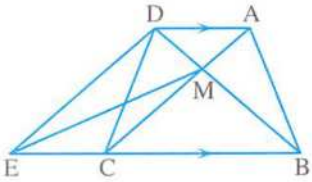
[b] In the opposite figure :

ABCD is a quadrilateral , $\overline{AD} // \overline{BC}$, $E \in \overrightarrow{BC}$

, $\overline{AC} \cap \overline{BD} = \{M\}$

, the area of Δ ABM = the area of Δ ECM

Prove that : $\overline{DE} // \overline{AC}$



10 El-Sharkia Governorate

Directorate of Education
Dep. of Governmental L. Schools

Answer the following questions :

1 **Choose the correct answer from those given :**

1 ABCD is a parallelogram in which AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its area = ... cm^2.

(a) 40 (b) 20 (c) 10 (d) 50

2 The number of axes of symmetry of the square is .....

(a) 1 (b) 2 (c) 3 (d) 4

3 In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then ∠ C is ..... angle.

(a) an acute (b) an obtuse (c) a right (d) a straight

4 If the projection of a line segment on a straight line is a point , then the line segment ..... straight line.

(a) // (b) ⊥ (c) ≡ (d) ⊂

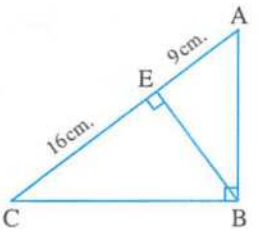
5 If M is the midpoint of $\overline{AB}$, then $(AB)^2$ = ... $(AM)^2$

(a) 2 (b) $\frac{1}{2}$ (c) 4 (d) $\frac{1}{4}$

6 The area of the rhombus whose diagonal lengths are 16 cm. , 18 cm. is ..... cm^2.

(a) 144 (b) 148 (c) 128 (d) 288

2 **Complete each of the following :**



1 **In the opposite figure :**
$m(\angle ABC) = 90°$, $\overline{BE} \perp \overline{AC}$
, EA = 9 cm. , EC = 16 cm. , then AB = ... cm.

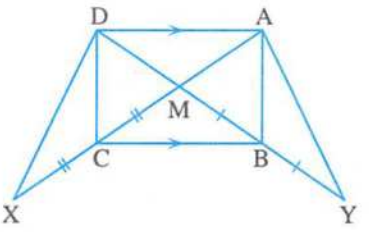
2 In ΔABC , if $(AB)^2 = (AC)^2 + (BC)^2$, then m (.....) = 90°

3 The two triangles are similar if their corresponding side lengths are .....

4 The median of a triangle divides its surface into .....

5 The area of the rectangle = ...

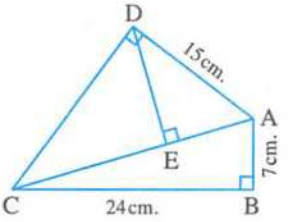
3 **[a] In the opposite figure :**
$\overline{AD} // \overline{BC}$, MB = BY
, MC = CX , $\overline{AX} \cap \overline{DY} = \{M\}$



Prove that : 1 the area of ΔMAB = the area of ΔMDC
2 the area of ΔABY = the area of ΔDCX

[b] Determine the type of the triangle ABC according to its angles where AB = 7 cm. , BC = 6 cm. , AC = 9 cm.

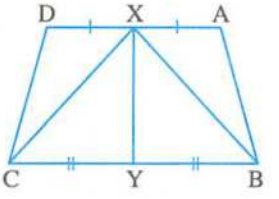
4 **[a] In the opposite figure :**
$m(\angle ADC) = m(\angle ABC) = 90°$, $\overline{DE} \perp \overline{AC}$
, AB = 7 cm. , BC = 24 cm.
, AD = 15 cm.



Find : 1 The length of each of $\overline{AC}$ and $\overline{DC}$
2 The length of the projection of $\overline{AD}$ on $\overleftrightarrow{AC}$

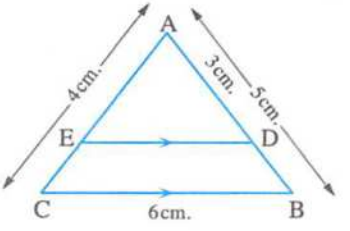
[b] Find the height of the a trapezium with area 450 cm^2 and its two bases lengths are 24 cm. , 12 cm.

5 **[a] In the opposite figure :**
ABCD is a quadrilateral , YC = YB
, X is the midpoint of $\overline{AD}$, Y is the midpoint of $\overline{BC}$
, the area of the figure ABYX = the area of the figure DCYX



Prove that : $\overline{AD} // \overline{BC}$

[b] In the opposite figure :
ABC is a triangle , AB = 5 cm.
, BC = 6 cm. , AC = 4 cm.
, AD = 3 cm. , $\overline{DE} // \overline{BC}$



1 **Prove that :** $\Delta ADE \sim \Delta ABC$

2 **Find the length of each of :** $\overline{DE}$ and $\overline{EC}$

11 El-Dakahlia Governorate

Directorate of Education
Maths Supervision

Answer the following questions :

1 Choose the correct answer :

1 The area of a rhombus whose diagonal lengths are 6 cm. and 10 cm. is ..... cm^2

(a) 60 (b) 120 (c) 30 (d) 15

2 In ΔXYZ , if $(XZ)^2 = (XY)^2 - (ZY)^2$, then $\angle Z$ is ..... angle.

(a) an acute (b) a straight (c) an obtuse (d) a right

3 If the perimeter of a square is 20 cm. , then its area = ... cm^2

(a) 400 (b) 10 (c) 25 (d) 12.5

4 If $\Delta ABC \sim \Delta XYZ$, then m ($\angle ACB$) = m ($\angle$ .....)

(a) XYZ (b) YXZ (c) ZYX (d) XZY

5 If the diameter length of a circle = 14 cm. , then its area = ... cm^2

(a) 154 (b) 44 (c) 616 (d) 22

6 If ABC is a triangle , m ($\angle B$) = 90° , $\overline{BD} \perp \overline{AC}$, then $(AB)^2 = AD \times$ .....

(a) AC (b) CD (c) BC (d) AD

2 Complete each of the following :

1 If the area of a square is 50 cm^2 , then its diagonal length is .....

2 Two polygons are similar if the corresponding side lengths are .....

3 If A $\in$ the straight line L , then its projection on the straight line L is .....

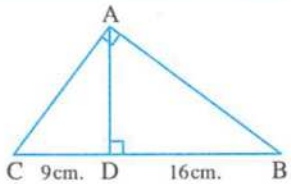
4 ABCD is a parallelogram , if m ($\angle A$) = 80° , then m ($\angle B$) = ... °

5 If the perimeter of an equilateral triangle is 30 cm. and its height is 5 cm. , then its area = ... cm^2

3 [a] In the opposite figure :

m ($\angle BAC$) = 90° , $\overline{AD} \perp \overline{BC}$, CD = 9 cm. and DB = 16 cm.

Find : AC and AD

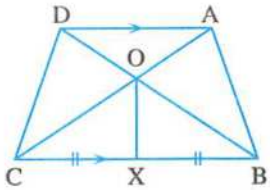


[b] In the opposite figure :

$\overline{DA} // \overline{CB}$, XB = XC

Prove that :

the area of the figure ABXO = the area of the figure DCXO



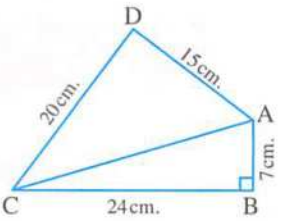
4 **[a] In the opposite figure :**

m (∠ B) = 90° , AB = 7 cm.

, BC = 24 cm. , AD = 15 cm.

and CD = 20 cm.

Prove that : m (∠ D) = 90°



[b] In Δ ABC , AB = 5 cm. , BC = 8 cm. and AC = 10 cm.

What is the type of the triangle according to its angles ? (Write steps)

5 **[a]** A trapezium , the lengths of the two parallel bases are 4 cm. and 10 cm. If its height is 5 cm. , calculate its middle base length and its area.

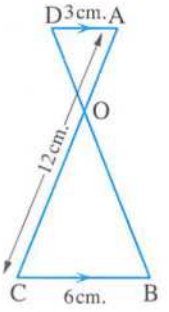
[b] In the opposite figure :

$\overline{DA}$ // $\overline{CB}$, AD = 3 cm. , BC = 6 cm.

and AC = 12 cm.

1 **Prove that :** Δ AOD ~ Δ COB

2 **Find :** the length of $\overline{AO}$



12 Suez Governorate

Directorate of Education
Inspection of Mathematics

Answer the following questions :

1 **Choose the correct answer :**

1 ABCD is a parallelogram in which m (∠ A) = 70° , then m (∠ B) = ...

(a) 70° (b) 110° (c) 180° (d) 540°

2 If ABC is a triangle , $(AB)^2 > (BC)^2 + (AC)^2$, then ∠ C is .....

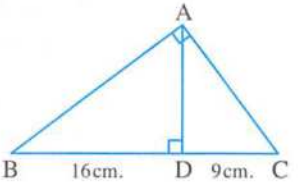
(a) acute. (b) right. (c) obtuse. (d) straight.

3 **In the opposite figure :**

m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

, DC = 9 cm. , DB = 16 cm.

, then AD = ... cm.



(a) 144 (b) 25 (c) 50 (d) 12

4 The area of the square whose diagonal length is 10 cm. is .....

(a) 100 cm^2 (b) 50 cm^2 (c) 40 cm^2 (d) 20 cm^2

5 A trapezium whose lengths of two parallel bases are 6 cm. and 8 cm. , then the length of its middle base equals ..... cm.

(a) 48 (b) 24 (c) 14 (d) 7

6 The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 2 : 3 (c) 3 : 5 (d) 1 : 2

2 Complete each of the following :

1 The median of a triangle divides its surface into two triangular surfaces equal .....

2 If ABC is a triangle , $(AC)^2 + (BC)^2 = (AB)^2$, then m ($\angle$ .....) = 90°

3 All the regular polygons that have the same number of sides are .....

4 The area of a rhombus is 24 cm^2 , if the length of one of its diagonals is 8 cm. , then the length of the other diagonal is .....

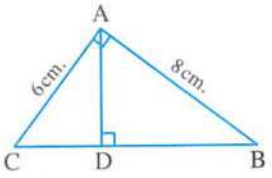
5 If the point A $\in$ the striaght line L , then the projection of the point A on the line L is .....

3 [a] In the opposite figure :

m ($\angle$ CAB) = 90° , $\overline{AD} \perp \overline{BC}$

, AC = 6 cm. , AB = 8 cm.

Find : the length of the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$

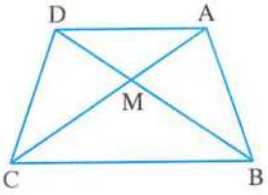


[b] In the opposite figure :

ABCD is a quadrilateral ,

the area of Δ AMB = the area of Δ DMC

Prove that : $\overline{AD} // \overline{BC}$



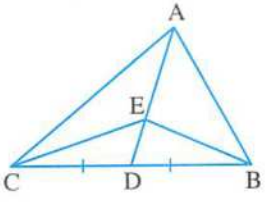
4 [a] Determine the type of the greatest angle in Δ ABC where AB = 9 cm. , BC = 10 cm. , AC = 12 cm.

[b] In the opposite figure :

$\overline{AD}$ is a median of Δ ABC , E $\in \overline{AD}$

Prove that :

The area of Δ ABE = the area of Δ ACE



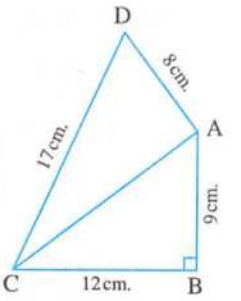
5 **[a] In the opposite figure :**

$m(\angle B) = 90°$, $AB = 9$ cm.

, $BC = 12$ cm. , $AD = 8$ cm.

, $DC = 17$ cm.

Prove that : $m(\angle DAC) = 90°$

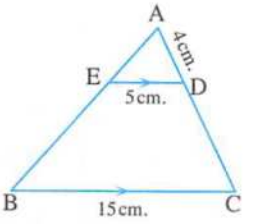


[b] In the opposite figure :

$\overline{ED} // \overline{BC}$, $AD = 4$ cm.

, $ED = 5$ cm. , $BC = 15$ cm.

Find with proof : The length of $\overline{DC}$



13 Port Said Governorate

East Educational Directorate
Mathematics Inspection

Answer the following questions :

1 **Choose the correct answer :**

1 In ΔABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 If the lengths of the diagonals of a rhombus are 6 cm. and 8 cm.
, then its perimeter = ... cm.

(a) 24 (b) 28 (c) 14 (d) 20

3 If ABCD is a parallelogram of area 20 cm^2 and $E \in \overline{AD}$
, then the area of ΔEBC = ... cm^2

(a) 10 (b) 5 (c) 20 (d) 40

4 If the projection of a line segment on a straight line is a point
, then the line segment ..... the straight line.

(a) // (b) $\perp$ (c) $\equiv$ (d) $\subset$

5 The two triangles drawn on a common base and their vertices located on a straight line parallel to the base are .....

(a) congruent. (b) similar.

(c) equal in perimeter. (d) equal in area.

6 ABCD is a parallelogram in which : $AB = 5$ cm. , $BC = 10$ cm. and its smaller height is 4 cm. , then its greater height is ..... cm.

(a) 2 (b) 4 (c) 8 (d) 10

2 **Complete each of the following :**

1 If $\angle A$ complements $\angle B$ and $\angle B$ supplements $\angle C$, $m(\angle A) = 30°$, then $m(\angle C) =$ ..... °

2 In ΔABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then $m(\angle$ .....$) = 90°$

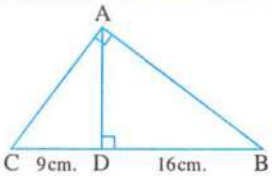
3 If two polygons are similar and the ratio between the lengths of two corresponding sides is 2 : 5 , then the ratio between their perimeters is .....

4 A trapezium whose lengths of the two parallel bases are 4 cm. and 6 cm. , then the length of its middle base is ..... cm.

5 The rectangle is a parallelogram in which one of its angles is .....

3 **[a] In the opposite figure :**

Find : the length of each of $\overline{AB}$, $\overline{AC}$ and $\overline{AD}$



[b] ABCD is a trapezium in which $\overline{AD} // \overline{BC}$, if BC = 2 AD = 20 cm. and its area = 180 cm^2 , find its height.

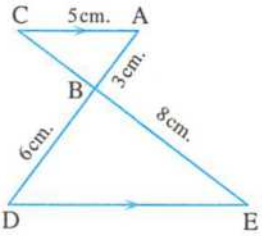
4 **[a] In the opposite figure :**

$\overline{AC} // \overline{ED}$, AB = 3 cm. , BD = 6 cm.

, AC = 5 cm. , BE = 8 cm.

Prove that : $\Delta ABC \sim \Delta DBE$

, then find : the length of each of $\overline{ED}$, $\overline{BC}$

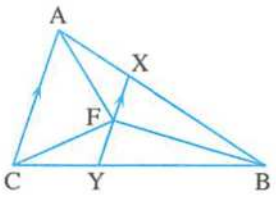


[b] In the opposite figure :

$\overline{AC} // \overline{XY}$ and F is the midpoint of $\overline{XY}$

Prove that :

The area of ΔABF = the area of ΔCBF



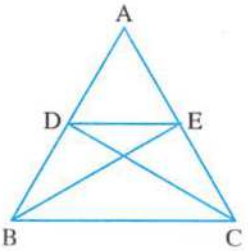
5 **[a] In the opposite figure :**

ABC is a triangle in which :

$D \in \overline{AB}$ and $E \in \overline{AC}$

, such that the area of ΔABE = the area of ΔACD

Prove that : $\overline{DE} // \overline{BC}$



[b] In the opposite figure :

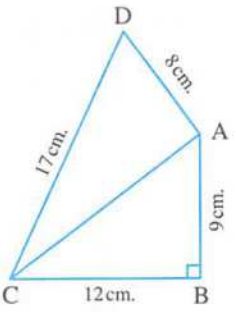
ABCD is a quadrilateral

, m (∠ B) = 90° , AB = 9 cm.

, BC = 12 cm. , CD = 17 cm.

and DA = 8 cm.

Prove that : m (∠ DAC) = 90°



14 El-Beheira Governorate

Bandar Damanhour Educational Zone
Amr Ibn El-Aass G.L.S.

Answer the following questions :

1 Choose the correct answer :

1 In Δ ABC , if $(AB)^2 = (AC)^2 - (BC)^2$, then ∠ C is ..... angle.

(a) an acute (b) an obtuse (c) a right (d) a straight

2 If the lengths of two adjacent sides in a parallelogram are 9 cm. and 6 cm. and the length of the smaller height is 4 cm. , then its area is ..... cm^2.

(a) 30 (b) 36 (c) 24 (d) 15

3 The diagonal length of a square whose area is 50 cm^2. equals ..... cm.

(a) 10 (b) 20 (c) 30 (d) 40

4 The median of a triangle divides its surface into two triangles .....

(a) congruent. (b) equal in area. (c) similar. (d) coincide.

5 If $\overline{AB}$ // $\overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) > (b) < (c) = (d) ≡

6 The number of axes of symmetry of the rhombus equals .....

(a) zero (b) 1 (c) 2 (d) 4

2 Complete each of the following :

1 In Δ ABC , if $(AB)^2 = (BC)^2 + (AC)^2$, m (∠ B) = 50° , then m (∠ A) = ... °

2 In the two similar polygons , their corresponding angles are .....

3 The area of a rhombus is 24 cm^2. , the length of one of its diagonals 8 is cm. , then the length of the other diagonal is ..... cm.

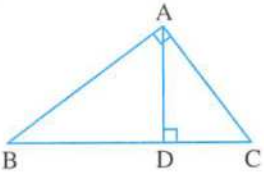
4 The sum of the measures of the exterior angles of a triangle equals .....°

5 **In the opposite figure :**

Δ ABC is a right-angled triangle at A

, $\overline{AD} \perp \overline{BC}$

$(AD)^2$ = ... × .....



3 **[a]** The area of a trapezium is 180 cm^2 , its height is 9 cm. Find the lengths of its parallel bases if the ratio between them is 3 : 5

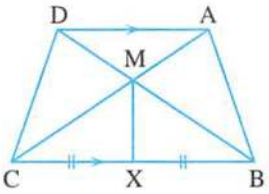
[b] In the opposite figure :

$\overline{AD} \parallel \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, X is the midpoint of $\overline{BC}$

Prove that : the area of the shape ABXM

= the area of the shape DCXM



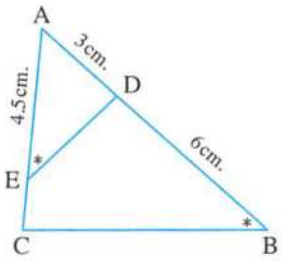
4 **[a] In the opposite figure :**

m (∠ AED) = m (∠ B)

, AD = 3 cm. , AE = 4.5 cm. , DB = 6 cm.

1 **Prove that :** Δ AED ~ Δ ABC

2 **Find :** the length of $\overline{CE}$



[b] In the opposite figure :

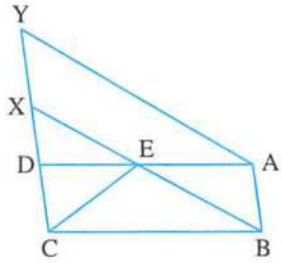
ABCD and ABXY

are two parallelograms.

Prove that :

the area of Δ EBC

$= \frac{1}{2}$ the area of ▱ ABXY

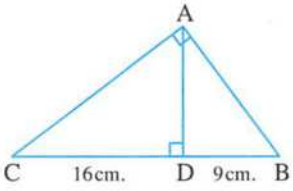


5 **[a] In the opposite figure :**

ABC is a right-angled triangle at A ,

D ∈ $\overline{CB}$, $\overline{AD} \perp \overline{CB}$, CD = 16 cm. , DB = 9 cm.

Find : the length of each of $\overline{AC}$, $\overline{AB}$, $\overline{AD}$



[b] ABC is a triangle in which , AB = 7 cm. , BC = 10 cm. , AC = 8 cm.

Determine the type of Δ ABC according to its angles.

15 Beni Suef Governorate

Directorate of Official Language Schools
Education Administration

Answer the following questions :

1 **Choose the correct answer :**

1 If the area of a parallelogram is 35 cm^2 and its height is 5 cm. , then the length of the corresponding base to this height is ..... cm.

(a) 5 (b) 7 (c) 9 (d) 30

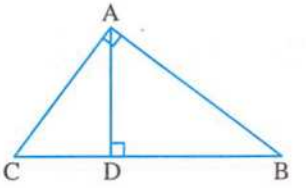
2 If the area of a trapezium is 32 cm^2 and its height is 4 cm. , then the length of its middle base equals ..... cm.

(a) 4 (b) 8 (c) 14 (d) 16

3 If two polygons are similar and the ratio between the lengths of two corresponding sides is 2 : 3 , then the ratio between their perimeters is .....

(a) 1 : 2 (b) 4 : 9 (c) 2 : 3 (d) 9 : 4

4 **In the opposite figure :**



Δ ABC is right-angled at A

, $\overline{AD} \perp \overline{BC}$, then $(AB)^2$ = ...

(a) BD × BC (b) DC × BC

(c) BD × DC (d) AD × BC

5 If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) = (b) > (c) < (d) $\neq$

6 The least number of the acute angles in any triangle is .....

(a) zero (b) 1 (c) 2 (d) 3

2 Complete each of the following :

1 Triangles with congruent bases on one straight line and have a common vertex are .....

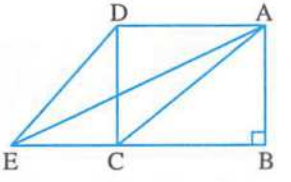
2 A triangle whose side lengths are 7 cm. , 14 cm. and 16 cm. , then its type according to its angles is .....

3 In Δ ABC , if $(AC)^2 < (AB)^2 + (BC)^2$, then the type of the angle B is .....

4 The sum of the measures of the interior angles of a triangle equals ..... °

5 Each two opposite angles in a parallelogram are .....

3 [a] In the opposite figure :

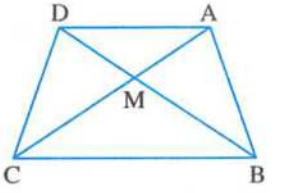


ABCD is a rectangle and $E \in \overrightarrow{BC}$

Prove that :

The area of Δ DAE = the area of Δ ABC

[b] In the opposite figure :



ABCD is a quadrilateral

, its diagonals intersect at M

and the area of Δ ABM = the area of Δ DCM

Prove that : $\overline{AD} \parallel \overline{BC}$

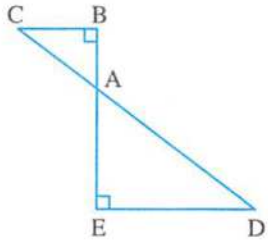
4 **[a]** Find the area of the rhombus whose diagonals lengths are 10 cm. and 8 cm.

[b] In the opposite figure :

$\overline{BE} \cap \overline{DC} = \{A\}$ and

$m(\angle B) = m(\angle E) = 90°$

Prove that : $\Delta ABC \sim \Delta AED$

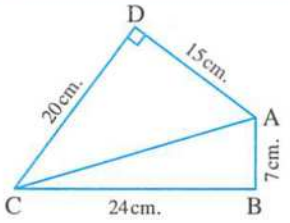


5 **[a] In the opposite figure :**

ABCD is a quadrilateral in which $m(\angle ADC) = 90°$

, AB = 7 cm. , BC = 24 cm. , CD = 20 cm. , DA = 15 cm.

Prove that : $m(\angle ABC) = 90°$



[b] In the opposite figure :

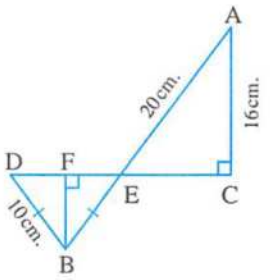
$\overline{AB} \cap \overline{CD} = \{E\}$

, E is the midpoint of $\overline{CD}$, $\overline{BF} \perp \overline{CD}$

, AC = 16 cm. , AE = 20 cm. and BD = BE = 10 cm.

Find the length of the projection

of $\overline{BD}$ on $\overleftrightarrow{CD}$



Answers of schools examinations on Geometry

1 Cairo

1

1 (b) 2 (c) 3 (c)
4 (c) 5 (a) 6 (c)

2

1 equal in area 2 the point A 3 proportional
4 5 5 4

3

[a] In $\Delta\Delta$ ADH , ACB $\because$ m ($\angle$ AHD) = m ($\angle$ B)
, $\angle$ A is a common angle
$\therefore$ m ($\angle$ ADH) = m ($\angle$ C)
$\therefore \Delta$ ADH ~ Δ ACB (First req.)
, $\frac{AD}{AC} = \frac{DH}{CB} = \frac{AH}{AB}$
$\therefore \frac{3}{AC} = \frac{4.5}{9}$ $\therefore AC = \frac{3 \times 9}{4.5} = 6$ cm.
$\therefore$ HC = 6 – 4.5 = 1.5 cm. (Second req.)

[b] $\because \Delta\Delta$ ABC , DBC have a common base $\overline{BC}$
, $\overline{AD} // \overline{BC}$
$\therefore$ The area of Δ ABC = the area of Δ DBC
Subtracting the area of Δ MBC from both sides.
$\therefore$ The area of Δ AMB = the area of Δ DMC (1)
(Q.E.D. 1)
, $\because \overline{MH}$ is a median in Δ BMC
$\therefore$ The area of Δ BMH = the area of Δ CMH (2)
adding (1) and (2) :
$\therefore$ The area of the figure ABHM
= the area of the figure DCHM (Q.E.D. 2)

4

[a] In Δ ABC : $\because$ m ($\angle$ BAC) = 90° , $\overline{AD} \perp \overline{BC}$
$\therefore (AB)^2 = BD \times BC = 9 \times 25 = 225$
$\therefore$ AB = 15 cm. (First req.)
, $\because \overline{AD}$ is the projection of $\overline{AC}$ on $\overline{AD}$
$\therefore (AD)^2 = BD \times CD = 9 \times 16 = 144$
$\therefore$ AD = 12 cm. (Second req.)

[b] Let the length of the other base be X cm.
$\therefore \frac{1}{2}(5 + X) \times 7 = 63$ $\therefore \frac{1}{2}(5 + X) = 9$
$\therefore 5 + X = 18$
$\therefore X = 13$
$\therefore$ The length of the other base is 13 cm. (The req.)

5

[a] $\because \overline{CO}$ is a median in Δ CDH
$\therefore$ The area of Δ COD = the area of Δ HOC
, $\because$ the area of Δ ABO = the area of Δ HOC
$\therefore$ The area of Δ ABO = the area of Δ COD
Adding area of Δ ADO to both sides
$\therefore$ The area of Δ ABD = the area of Δ ACD
and they have a common base $\overline{AD}$ and on one side of it
$\therefore \overline{AD} // \overline{BC}$ (Q.E.D.)

[b] $\because (AC)^2 = (7)^2 = 49$
, $(AB)^2 + (BC)^2 = (5)^2 + (6)^2 = 61$
$\because (AC)^2 < (AB)^2 + (BC)^2$
$\therefore \Delta$ ABC is acute-angled triangle (The req.)

2 Cairo

1

1 (c) 2 (b) 3 (a)
4 (b) 5 (b) 6 (c)

2

1 proportional , equal in measure.
2 120° 3 >
4 50 5 30 cm.

3

[a] In Δ ABD : $\because \overline{DB} \perp \overline{AB}$
$\therefore$ m ($\angle$ ABD) = 90°
$\therefore (BD)^2 = (AD)^2 - (AB)^2 = (17)^2 - (8)^2 = 225$
$\therefore$ BD = 15 cm. (First req.)
In Δ BCD :
$\because (BD)^2 = (15)^2 = 225$
, $(BC)^2 + (CD)^2 = (9)^2 + (12)^2 = 225$
$\therefore (BD)^2 = (BC)^2 + (CD)^2$
$\therefore$ m ($\angle$ C) = 90° (Second req.)

[b] $\because \overline{AD}$ is a median in Δ ABC
$\therefore$ The area of Δ ABD = The area of Δ ACD (1)
$\because \overline{ED}$ is a median in Δ EBC
$\therefore$ The area of Δ EBD = The area of Δ ECD (2)

Subtracting (2) from (1) :

$\therefore$ The area of Δ ABE = The area of Δ ACE

(Q.E.D.)

4

[a] $\because \Delta AXY \sim \Delta ABC$

$\therefore \frac{AY}{AC} = \frac{AX}{AB}$ $\quad \therefore \frac{6}{AC} = \frac{7}{14}$

$\therefore AC = \frac{6 \times 14}{7} = 12$ cm.

$\therefore XC = 12 - 7 = 5$ cm. (The req.)

[b] $\because \Delta\Delta$ ADB , ADC have the same base $\overline{AD}$

, $\overline{BC} // \overline{AD}$

$\therefore$ The area of Δ ADB = The area of Δ ADC

Subtracting the area of Δ AMD from both sides

$\therefore$ The area of Δ AMB = The area of Δ DMC (1)

, $\because \overline{MD}$ is median in Δ EMC

$\therefore$ The area of Δ MDE = The area of Δ DMC (2)

From (1) and (2) :

$\therefore$ The area of Δ MDE = The area of Δ AMB

(Q. E. D.)

5

In Δ BCD : $\because$ m ($\angle$ BCD) = 90°

$\therefore (BD)^2 = (BC)^2 + (CD)^2 = (7)^2 + (24)^2 = 625$

$\therefore$ BD = 25 cm.

, in Δ ABD : $\because$ m ($\angle$ BAD) = 90°

$\therefore (AD)^2 = (BD)^2 - (AB)^2 = (25)^2 - (15)^2 = 400$

$\therefore$ AD = 20 cm. (First req.)

, $\because \overline{EB}$ is the projection $\overline{AB}$ on $\overline{BD}$

, $\because (AB)^2 = EB \times BD$ $\quad \therefore (15)^2 = EB \times 25$

$\therefore 225 = EB \times 25$

$\therefore EB = \frac{225}{25} = 9$ cm. (Second req.)

3 Cairo

1

1 10 cm.	2 6 cm.	3 similar
4 equal	5 40 cm^2	

2

1 (b)	2 (c)	3 (a)
4 (b)	5 (a)	6 (c)

3

[a] In Δ ABC : $\because$ m ($\angle$ B) = 90°

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (3)^2 + (4)^2 = 25$

$\therefore$ AC = 5 cm.

In Δ ACD : $\because (AD)^2 = (13)^2 = 169$

, $(AC)^2 + (CD)^2 = (5)^2 + (12)^2 = 169$

$\therefore (AD)^2 = (AC)^2 + (CD)^2$

$\therefore$ m ($\angle$ ACD) = 90° (Q.E.D.)

[b] $\because$ The area of Δ ADC = the area of Δ AEB

subtracting the area of Δ ADE from both sides

$\therefore$ The area of Δ CDE = the area of Δ BDE

but they have a common base $\overline{DE}$ and on one side of it

$\therefore \overline{DE} // \overline{BC}$ (Q.E.D.)

4

[a] In $\Delta\Delta$ ABC , DBE

$\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{AD}$ is a transversal

$\therefore$ m ($\angle$ A) = m ($\angle$ D) (alternate angles) (1)

, $\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{CE}$ is a transversal

$\therefore$ m ($\angle$ C) = m ($\angle$ E) (alternate angles) (2)

, $\because$ m ($\angle$ ABC) = m ($\angle$ DBE) (V.O.A.) (3)

From (1) , (2) and (3)

$\therefore \Delta ABC \sim \Delta DBE$ (First req.)

, $\frac{AB}{DB} = \frac{BC}{BE} = \frac{AC}{DE}$

$\therefore \frac{3}{6} = \frac{BC}{8} = \frac{5}{DE}$ $\quad \therefore BC = \frac{3 \times 8}{6} = 4$ cm.

, $DE = \frac{6 \times 5}{3} = 10$ cm. (Second req.)

[b] $\because \Delta\Delta$ ABC , DBC have the same base $\overline{BC}$

, $\overline{BC} // \overline{AD}$

$\therefore$ The area of Δ ABC = the area of Δ DBC

subtracting the area of Δ MBC from both sides

$\therefore$ The area of Δ AMB = the area of Δ DMC (1)

, $\because \Delta\Delta$ MBX , MCY have equal bases in length and on one straight line and they are common in the vertex M

$\therefore$ The area of Δ MBX = the area of Δ MCY (2)

Adding (1) and (2) :

$\therefore$ The area of the shape ABXM = the area of the shape DCYM (Q.E.D.)

5

In ΔABC : $\because m(\angle BAC) = 90°$, $\overline{AD} \perp \overline{BC}$

$\therefore (AB)^2 = BD \times BC = 9 \times 25 = 225$

$\therefore AB = 15$ cm. (first req.)

, $\because \overline{AD}$ is the projection of $\overline{AC}$ on $\overline{AD}$

$\therefore (AD)^2 = BD \times CD = 9 \times 16 = 144$

$\therefore AD = 12$ cm. (Second req.)

, the area of $\Delta ABC = \frac{1}{2} \times BC \times AD$

$= \frac{1}{2} \times 25 \times 12 = 150$ cm^2.

(Third req.)

4 Giza

1

1 72 2 zero

3 equal in measure , proportional

4 lying on one of two parallel straight lines including them

5 an acute-angled

2

1 (b) 2 (c) 3 (c)

4 (b) 5 (c) 6 (a)

3

[a] In $\Delta\Delta AMB$, DMC

$\because \overline{AB} // \overline{CD}$, $\overline{AD}$ is a transversal

$\therefore m(\angle A) = m(\angle D)$ (alternate angles) (1)

, $\because \overline{AB} // \overline{CD}$, $\overline{BC}$ is a transversal

$\therefore m(\angle B) = m(\angle C)$ (alternate angles) (2)

, $\because m(\angle AMB) = m(\angle DMC)$ (V.O.A) (3)

From (1) , (2) and (3) :

$\therefore \Delta AMB \sim \Delta DMC$ (First req.)

, $\frac{AM}{DM} = \frac{MB}{MC} = \frac{AB}{DC}$ $\therefore \frac{6}{12} = \frac{10}{DC}$

$\therefore DC = \frac{10 \times 12}{6} = 20$ cm. (Second req.)

[b] Let the height of trapezium be X cm.

$\therefore \frac{1}{2}(24 + 12) \times X = 450$ $\therefore 18X = 450$

$\therefore X = \frac{450}{18} = 25$ cm.

$\therefore$ The height is : 25 cm. (The req.)

4

[a] In ΔABC : $\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (12)^2 + (16)^2 = 400$

$\therefore AC = 20$ cm. (First req.)

In ΔACD : $\because (CD)^2 = (25)^2 = 625$

, $(AD)^2 + (AC)^2 = (15)^2 + (20)^2 = 625$

, $\because (CD)^2 = (AD)^2 + (AC)^2$

$\therefore m(\angle DAC) = 90°$ (Second req.)

[b] In ΔABC : $\because (AC)^2 = (13)^2 = 169$

, $(AB)^2 + (BC)^2 = (12)^2 + (5)^2 = 169$

, $\because (AC)^2 = (AB)^2 + (BC)^2$

$\therefore \Delta ABC$ is right-angled triangle at B

, the area of $\Delta ABC = \frac{1}{2} \times 12 \times 5 = 30$ cm^2.

(The req.)

5

[a] $\because \Delta\Delta ACD$, BCD have a common base $\overline{CD}$

, $\overline{AB} // \overline{CD}$

$\therefore$ The area of ΔACD = the area of ΔBCD (1)

, $\because \overline{ME}$ is a median in ΔCMD

$\therefore$ The area of ΔEMC = the area of ΔEMD (2)

subtracting (2) From (1) :

$\therefore$ The area of the figure ADEM = the area of the figure BCEM (Q.E.D.)

[b] In ΔABC : $\because m(\angle BAC) = 90°$, $\overline{AD} \perp \overline{BC}$

$\therefore (AD)^2 = BD \times CD = 4.5 \times 8 = 36$

$\therefore AD = 6$ cm.

, $(AB)^2 = BD \times BC = 4.5 \times 12.5 = 56.25$

$\therefore AB = 7.5$ cm.

, $(AC)^2 = CD \times BC = 8 \times 12.5 = 100$

$\therefore AC = 10$ cm. (The req.)

5 Giza

1

1 (c) 2 (b) 3 (d)

4 (a) 5 (c) 6 (b)

2

1 equal 2 proportional

3 The point B 4 equal in area

5 18

3

[a] ∵ ΔΔ ABD , ACD have the same base $\overline{AD}$

, $\overline{BC} // \overline{AD}$

∴ The area of Δ ABD = the area of Δ ACD

Subtrating the area of Δ AMD from both sides

∴ The area of Δ AMB = the area of Δ DMC (1)

∵ ΔΔ MBX , MCY have equal bases in length and on one straight line and they are common in the vertex M

∴ The area of Δ MBX = the area of Δ MCY (2)

Adding (1) and (2) :

∴ The area of the shape ABXM = The area of the shape DCYM (Q.E.D.)

[b] In Δ ABC : ∵ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

∴ $(AC)^2 = CD \times CB = 8 \times 12.5 = 100$

∴ AC = 10 cm.

, $(AB)^2 = BD \times BC = 4.5 \times 12.5 = 56.25$

∴ AB = 7.5 cm.

, $(AD)^2 = BD \times CD = 4.5 \times 8 = 36$

∴ AD = 6 cm. (The req.)

4

[a] In ΔΔ AMB , DMC

∵ $\overline{AB} // \overline{CD}$, $\overleftrightarrow{AD}$ is a transversal

∴ m (∠ A) = m (∠ D) (alternate angles) (1)

, ∵ $\overline{AB} // \overline{CD}$, $\overline{BC}$ is a transversal

∴ m (∠ B) = m (∠ C) (alternate angles) (2)

, ∵ m (∠ AMB) = m (∠ DMC) (V. O. A.) (3)

From (1) , (2) and (3) :

∴ Δ AMB ~ Δ DMC (First req.)

, $\frac{AM}{DM} = \frac{MB}{MC} = \frac{AB}{DC}$

∴ $\frac{6}{12} = \frac{MB}{16} = \frac{10}{DC}$

∴ $DC = \frac{10 \times 12}{6} = 20$ cm.

, $MB = \frac{6 \times 16}{12} = 8$ cm. (Second req.)

[b] In Δ ABC : ∵ $(AC)^2 = (7)^2 = 49$

, $(AB)^2 + (BC)^2 = (5)^2 + (6)^2 = 61$

, ∵ $(AC)^2 < (AB)^2 + (BC)^2$

∴ Δ ABC is an acute-angled triangle. (The req.)

5

[a] In Δ BCD : ∵ m (∠ BCD) = 90°

∴ $(BD)^2 = (BC)^2 + (CD)^2 = (7)^2 + (24)^2 = 625$

In Δ BAD : ∵ $(BD)^2 = 625$

, $(AB)^2 + (AD)^2 = (15)^2 + (20)^2 = 625$

, ∵ $(BD)^2 = (AB)^2 + (AD)^2$

∴ m (∠ BAD) = 90° (Q. E. D.)

[b] ∵ The area of Δ ADC = the area of Δ AEB

Subtracting the area of Δ ADE from both sides

∴ The area of Δ CED = the area of Δ BDE and they have a common base $\overline{DE}$ and on one side of it

∴ $\overline{DE} // \overline{BC}$ (Q.E.D.)

6 Giza

1

1 (b)	2 (b)	3 (d)
4 (d)	5 (b)	6 (a)

2

1 congruent	2 45	3 15

4 an obtuse-angled

5 75°

3

[a] ∵ Δ BFC , ▱ ABCD have the common base $\overline{BC}$, ∵ $F \in \overline{AD}$

∴ The area of Δ BFC = $\frac{1}{2}$ the area of ▱ ABCD (1)

∵ $\overline{FB}$ is a median in Δ FEC

∴ The area of Δ BFC = $\frac{1}{2}$ the area of Δ FEC (2)

From (1) and (2) :

∴ The area of Δ FEC = The area of ▱ ABCD (Q.E.D.)

[b] In Δ ABC : ∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$

∴ AC = 15 cm.

In Δ ADC : ∵ $(CD)^2 = (17)^2 = 289$

, $(AD)^2 + (AC)^2 = (8)^2 + (15)^2 = 289$

, ∵ $(CD)^2 = (AD)^2 + (AC)^2$

∴ m (∠ DAC) = 90° (Q.E.D.)

4

[a] In $\Delta\Delta$ CED , CBA

$\because$ m ($\angle$ DEC) = m ($\angle$ ABC) = 90°

, $\angle$ C is a common angle

$\therefore$ m ($\angle$ EDC) = m ($\angle$ BAC)

$\therefore \Delta CED \sim \Delta CBA$ (First req.)

$\therefore \frac{ED}{AB} = \frac{CD}{AC}$ $\therefore \frac{3}{6} = \frac{5}{AC}$

$\therefore AC = \frac{5 \times 6}{3} = 10$ cm. (Second req.)

[b] $\because$ ABEC is a parallelogram , $\overline{BC}$ is a diagonal of it

$\therefore$ The area of Δ ABC = the area of Δ BEC

but the area of Δ BEC = the area of Δ DBC

$\therefore$ The area of Δ ABC = the area of Δ DBC

and they have the common base $\overline{BC}$ and on one side of it.

$\therefore \overline{AD} // \overline{BC}$ (Q.E.D.)

5

[a] In $\Delta\Delta$ ABC , DBE

$\because \overline{AC} // \overline{ED}$, $\overline{AD}$ is a transversal

$\therefore$ m ($\angle$ A) = m ($\angle$ D) (alternate angles) (1)

, $\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{CE}$ is a transversal

$\therefore$ m ($\angle$ C) = m ($\angle$ E) (alternate angles) (2)

, $\because$ m ($\angle$ ABC) = m ($\angle$ DBE) (V.O.A.) (3)

From (1) , (2) and (3) :

$\therefore \Delta ABC - \Delta DBE$ (First req.)

, $\frac{AB}{DB} = \frac{BC}{BE} = \frac{AC}{ED}$

$\therefore \frac{3}{6} = \frac{5}{ED}$ $\therefore ED = \frac{5 \times 6}{3} = 10$ cm.

$\therefore$ The perimeter of Δ BED = 6 + 8 + 10 = 24 cm.

(Second req.)

[b] In Δ ABC : $\because$ m ($\angle$ BAC) = 90°

$\therefore (BC)^2 = (AC)^2 + (AB)^2 = (6)^2 + (8)^2 = 100$

$\therefore$ BC = 10 cm.

, $\because \overline{EB}$ is the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$

, $\because (AB)^2 = EB \times BC$ $\therefore 64 = EB \times 10$

$\therefore$ EB = 6.4 cm. (First req.)

$\therefore$ EC = 10 – 6.4 = 3.6 cm. (Second req.)

7 Alexandria

1

1 48 2 0 3 13

4 an acute-angled 5 1

2

1 (a) 2 (c) 3 (a)

4 (d) 5 (b) 6 (c)

3

[a] In Δ ABC : $\because \overline{AD}$ is a median

$\therefore$ The area of Δ ADC = $\frac{1}{2}$ the area of Δ ABC (1)

, $\because$ M is the point of concurrence

$\therefore AM = \frac{2}{3}$ AD

$\therefore$ The area of Δ AMC = $\frac{2}{3}$ the area of Δ ADC (2)

From (1) and (2) :

$\therefore$ The area of Δ AMC = $\frac{2}{3}\left(\frac{1}{2}\right.$ the area of Δ ABC$\left.\right)$

$\therefore$ The area of Δ AMC = $\frac{1}{3}$ the area of Δ ABC

(Q. E. D.)

[b] $\because \Delta$ EBC has the common base $\overline{BC}$ with the $\square$ ABCD , E $\in \overline{AD}$

$\therefore$ The area of Δ EBC = $\frac{1}{2}$ the area of $\square$ ABCD

but the area of $\square$ ABCD = the area of $\square$ ABMN

(have a common base $\overline{AB}$ and between two parallel straight lines $\overleftrightarrow{AB}$, $\overleftrightarrow{CN}$)

$\therefore$ The area of Δ EBC = $\frac{1}{2}$ the area of $\square$ ABMN

(Q. E. D.)

4

[a] In Δ ABD : $\because$ m ($\angle$ ABD) = 90°

$\therefore (BD)^2 = (AD)^2 - (AB)^2$

$\therefore (BD)^2 = (5)^2 - (3)^2 = 16$

$\therefore$ BD = 4 cm.

, in Δ BCD : $\because$ m ($\angle$ BCD) = 90°

, m ($\angle$ BDC) = 30°

$\therefore BC = \frac{1}{2}$ BD $= \frac{1}{2} \times 4 = 2$ cm. (The req.)

[b] In $\Delta\Delta$ ABC , DEC

$\because$ m ($\angle$ ABC) = m ($\angle$ DEC) = 90°

, $\angle$ C is common angle

$\therefore m(\angle BAC) = m(\angle EDC)$

$\therefore \Delta ABC \sim \Delta DEC$ (First req.)

$\because \frac{AB}{DE} = \frac{AC}{DC}$ $\therefore \frac{6}{3} = \frac{AC}{5}$

$\therefore AC = \frac{5 \times 6}{3} = 10$ cm. (Second req.)

5

[a] Let the length of the other base be X cm.

$\therefore \frac{1}{2}(10 + X) \times 8 = 88$ $\therefore \frac{1}{2}(10 + X) = 11$

$\therefore 10 + X = 22$ $\therefore X = 12$ cm.

$\therefore$ the length of the other base = 12 cm. (The req.)

[b] In ΔABD : $\because m(\angle ABD) = 90°$

$\therefore (AB)^2 = (AD)^2 - (BD)^2 = (17)^2 - (8)^2 = 225$

$\therefore AB = 15$ cm. (First req.)

, in ΔABC : $\because (AB)^2 = 225$

, $(BC)^2 + (AC)^2 = (9)^2 + (12)^2 = 225$

, $\because (AB)^2 = (BC)^2 + (AC)^2$

$\therefore m(\angle ACB) = 90$ (Second req.)

, $\because \overline{AE}$ is the projection of $\overline{AC}$ on $\overline{AB}$

, $\because (AC)^2 = AE \times AB$ $\therefore 144 = AE \times 15$

$\therefore AE = \frac{144}{15} = 9.6$ cm. (Third req.)

8 Alexandria

1

1 (c) 2 (a) 3 (c)

4 (b) 5 (b) 6 (b)

2

1 equal in measure 2 C 3 110°

4 2 5 3 : 5

3

[a] In ΔABC : $\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$

$\therefore AC = 15$ cm.

In ΔDAC : $\because (DC)^2 = (17)^2 = 289$

, $(AD)^2 + (AC)^2 = (8)^2 + (15)^2 = 289$

$\therefore (DC)^2 = (AD)^2 + (AC)^2$

$\therefore m(\angle DAC) = 90°$ (Q.E.D.)

[b] 1 $\overline{DC}$ 2 the point D

4

[a] $\because$ The area of ΔAEB = the area of ΔDEC

Adding the area of ΔADE to both sides

$\therefore$ The area of ΔABD = the area of ΔACD

and they have a common side $\overline{AD}$ and on one side of it

$\therefore \overline{AD} // \overline{BC}$ (Q.E.D.)

[b] In ΔOED : $\because m(\angle OED) = 90°$, $\overline{EN} \perp \overline{OD}$

$\therefore (EN)^2 = ON \times DN = 9 \times 16 = 144$

$\therefore EN = 12$ cm.

, $(EO)^2 = ON \times DO = 9 \times 25 = 225$

$\therefore EO = 15$ cm.

, $(ED)^2 = DN \times DO = 16 \times 25 = 400$

$\therefore ED = 20$ cm. (The req.)

5

$\because \overline{AB} // \overline{DE}$, $\overline{AD} // \overline{BE}$

$\therefore$ ABED is a parallelogram

, $\because$ the rectangle XDEY and the parallelogram ABED have the common base $\overline{DE}$

$\because \overline{AY} // \overline{DE}$

$\therefore$ the area of $\square$ ABED = the area of the rectangle XDEY (First req.)

, $\because$ the area of the rectangle XDEY

$= 12 \times 24 = 288$ cm^2

$\therefore$ The area of $\square$ ABED = 288 cm^2 (Second req.)

$\therefore$ The length of the perpendicular from B to $\overline{AD}$

$= \frac{\text{The area of } \square \text{ ABED}}{AD} = \frac{288}{30} = 9.6$ cm.

(Third req.)

9 El-Kalyoubia

1

1 (b) 2 (b) 3 (b)

4 (a) 5 (d) 6 (c)

2

1 corresponding height

2 their corresponding side lengths are proportional , their corresponding angles are equal in measure

3 the point A 4 C 5 equal in area

3

[a] In Δ DEO : $\because$ m ($\angle$ DEO) = 90° , $\overline{EN} \perp \overline{OD}$

$\therefore (EN)^2 = ON \times DN = 9 \times 16 = 144$

$\therefore$ EN = 12 cm.

, $(ED)^2 = DN \times DO = 16 \times 25 = 400$

$\therefore$ ED = 20 cm.

, $(EO)^2 = ON \times DO = 9 \times 25 = 225$

$\therefore$ EO = 15 cm. (The req.)

[b] $\because$ $\overline{AD}$ is a median in Δ ABC

$\therefore$ The area of Δ ABD = the area of Δ ACD (1)

, $\because$ $\overline{ED}$ is a median in Δ EBC

$\therefore$ The area of Δ EBD = the area of Δ ECD (2)

Subtracting (2) from (1) :

$\therefore$ The area of Δ AEB = the area of Δ AEC

(Q.E.D.)

4

[a] In $\Delta\Delta$ ADE , ABC

$\because$ $\overline{DE} \parallel \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

$\therefore$ m ($\angle$ ADE) = m ($\angle$ B)

(corresponding angles) (1)

, $\because$ $\overline{DE} \parallel \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

$\therefore$ m ($\angle$ AED) = m ($\angle$ C)

(corresponding angles) (2)

, $\because$ $\angle$ A is a common angle (3)

From (1) , (2) and (3) :

$\therefore \Delta ADE \sim \Delta ABC$ (First req.)

, $\frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$

$\therefore \frac{3}{5} = \frac{DE}{6} = \frac{AE}{4}$ $\therefore DE = \frac{3 \times 6}{5} = 3.6$ cm.

, $AE = \frac{3 \times 4}{5} = 2.4$ cm. (Second req.)

[b] Let the length of other base be X cm.

$\therefore \frac{1}{2}(15 + X) \times 8 = 108$ $\therefore \frac{1}{2}(15 + X) = \frac{27}{2}$

$\therefore 15 + X = 27$ $\therefore X = 12$ cm.

$\therefore$ The length of other base = 12 cm. (The req.)

5

[a] In Δ ABC : $\because$ m ($\angle$ B) = 90°

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$

$\therefore$ AC = 15 cm.

In Δ ADC : $\because (CD)^2 = (17)^2 = 289$

, $(AD)^2 + (AC)^2 = (8)^2 + (15)^2 = 289$

, $\because (CD)^2 = (AD)^2 + (AC)^2$

$\therefore$ m ($\angle$ DAC) = 90° (Q.E.D.)

[b] $\because$ $\Delta\Delta$ ABD , ACD have a common base $\overline{AD}$

, $\overline{AD} \parallel \overline{BC}$

$\therefore$ The area of Δ ABD = the area of Δ ACD

subtracting the area of Δ AMD from both sides

$\therefore$ The area of Δ ABM = the area of Δ DCM

, $\because$ the area of Δ ABM = the area of Δ ECM

$\therefore$ The area of Δ DCM = the area of Δ ECM

and they have a common base $\overline{CM}$ and on one side of it

$\therefore$ $\overline{DE} \parallel \overline{CM}$ $\therefore$ $\overline{DE} \parallel \overline{AC}$ (Q.E.D.)

10 El-Sharkia

1

1 (a) 2 (d) 3 (b)

4 (b) 5 (c) 6 (a)

2

1 15 2 $\angle$ C 3 proportional

4 two triangles equal in area

5 length × width

3

[a] $\because$ $\Delta\Delta$ ABD , ACD have the same base $\overline{AD}$

, $\overline{AD} \parallel \overline{BC}$

$\therefore$ The area of Δ ABD = the area of Δ ACD

subtracting the area of Δ AMD from both sides

$\therefore$ The area of Δ ABM = the area of Δ DCM (1)

(Q.E.D.1)

$\because$ $\overline{AB}$ is a median in Δ AYM

$\therefore$ The area of Δ AMB = tha area of Δ AYB (2)

$\because$ $\overline{DC}$ is a median in Δ DMX

$\therefore$ The area of Δ DMC = the area of Δ DCX (3)

from (1) , (2) and (3) :

$\therefore$ The area of Δ AYB = the area of Δ DCX

(Q.E.D.2)

[b] In ΔABC : $\because (AC)^2 = (9)^2 = 81$

$, (AB)^2 + (BC)^2 = (7)^2 + (6)^2 = 85$

$, \because (AC)^2 < (AB)^2 + (BC)^2$

$\therefore \Delta ABC$ is an acute-angled triangle (The req.)

4

[a] In ΔABC : $\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (7)^2 + (24)^2 = 625$

$\therefore AC = 25$ cm.

In ΔADC : $\because m(\angle ADC) = 90°$

$\therefore (DC)^2 = (AC)^2 - (AD)^2 = (25)^2 - (15)^2 = 400$

$\therefore DC = 20$ cm. (First req.)

$, \because \overline{AE}$ is the projection of $\overline{AD}$ on $\overrightarrow{AC}$

$, \because (AD)^2 = AE \times AC$

$\therefore 225 = AE \times 25$

$\therefore AE = \frac{225}{25} = 9$ cm. (Second req.)

[b] $\because \frac{1}{2}(24 + 12) \times h = 450$ $\therefore 18\,h = 450$

$\therefore h = \frac{450}{18} = 25$ cm. (The req.)

5

[a] $\because \overline{XY}$ is a median in ΔBCX

$\therefore$ The area of BXY = the area of ΔCXY (1)

$, \because$ the area of the figure ABYX = the area of the figure DCYX (2)

subtracting (1) from (2) :

$\therefore$ The area of ΔABX = the area of ΔCDX

$, \because AX = DX$

$\therefore \overline{AD} // \overline{BC}$ (Q.E.D.)

[b] In $\Delta\Delta ADE$, ABC

$\because \overline{DE} // \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

$\therefore m(\angle ADE) = m(\angle B)$

(corresponding angles) (1)

$, \because \overline{DE} // \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

$\therefore m(\angle AED) = m(\angle C)$

(corresponding angles) (2)

$, \because \angle A$ is a common angle (3)

From (1) , (2) and (3) :

$\therefore \Delta ADE \sim \Delta ABC$ (First req.)

$, \frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$

$\therefore \frac{3}{5} = \frac{DE}{6} = \frac{AE}{4}$ $\therefore DE = \frac{3 \times 6}{5} = 3.6$ cm.

$, AE = \frac{3 \times 4}{5} = 2.4$ cm.

$\therefore EC = 4 - 2.4 = 1.6$ cm. (Second req.)

11 El-Dakahlia

1

1 (c)	2 (d)	3 (c)
4 (d)	5 (a)	6 (a)

2

1 10 cm.	2 proportional	
3 the point A	4 100°	5 25

3

[a] In ΔABC : $\because m(\angle BAC) = 90°$, $\overline{AD} \perp \overline{BC}$

$\therefore (AC)^2 = CD \times CB = 9 \times 25 = 225$

$\therefore AC = 15$ cm.

$, (AD)^2 = CD \times BD = 9 \times 16 = 144$

$\therefore AD = 12$ cm. (The req.)

[b] $\because \Delta\Delta ABC$, DBC have a common base $\overline{BC}$

$, \overline{AD} // \overline{BC}$

$\therefore$ The area of ΔABC = the area of ΔDBC

Subtracting the area of ΔOBC from both sides.

$\therefore$ The area of ΔAOB = the area of ΔDOC (1)

$\because \overline{OX}$ is a median in ΔOBC

$\therefore$ The area of ΔBOX = the area of ΔCOX (2)

Adding (1) and (2) :

$\therefore$ The area of the figure ABXO = the area of the figure DCXO (Q. E. D.)

4

[a] In ΔABC : $\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (7)^2 + (24)^2 = 625$

In ΔACD : $\because (AC)^2 = 625$

$, (AD)^2 + (CD)^2 = (15)^2 + (20)^2 = 625$

$\therefore (AC)^2 = (AD)^2 + (CD)^2$

$\therefore m(\angle D) = 90°$ (Q.E.D.)

[b] In ΔABC : $\because (AC)^2 = (10)^2 = 100$

$, (AB)^2 + (BC)^2 = (5)^2 + (8)^2 = 89$

$\therefore (AC)^2 > (AB)^2 + (BC)^2$

$\therefore \Delta ABC$ is an obtuse-angled triangle. (The req.)

5

[a] The length of the middle base $= \frac{1}{2}(4 + 10) = 7$ cm.

, the area of the trapezium $= 7 \times 5 = 35$ cm^2.

(The req.)

[b] In $\Delta\Delta$ AOD , COB

$\because \overline{DA} // \overline{CB}$, $\overleftrightarrow{AC}$ is a transversal

$\therefore$ m ($\angle$ A) = m ($\angle$ C) (alternate angles) (1)

, $\because \overline{DA} // \overline{CB}$, $\overleftrightarrow{DB}$ is a transversal

$\therefore$ m ($\angle$ D) = m ($\angle$ B) (alternate angles) (2)

, $\because$ m ($\angle$ AOD) = m ($\angle$ BOC) (V. O. A.) (3)

From (1) , (2) and (3) :

$\therefore \Delta AOD \sim \Delta COB$ (First req.)

, $\frac{AO}{CO} = \frac{AD}{CB}$ $\therefore \frac{AO}{12 - AO} = \frac{3}{6}$

$\therefore 6\,AO = 36 - 3\,AO$

$\therefore 6\,AO + 3\,AO = 36$ $\therefore 9\,AO = 36$

$\therefore AO = \frac{36}{9} = 4$ cm. (Second req.)

12 Suez

1

1 (b) 2 (c) 3 (d)

4 (b) 5 (d) 6 (c)

2

1 in area 2 C

3 similar 4 6 cm.

5 the point A

3

[a] In Δ ABC : $\because$ m ($\angle$ CAB) = 90°

$\therefore (BC)^2 = (AC)^2 + (AB)^2 = (6)^2 + (8)^2 = 100$

$\therefore$ BC = 10 cm.

, $\because \overline{DB}$ is the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$

, $(AB)^2 = DB \times BC$

$\therefore 64 = DB \times 10$

$\therefore DB = \frac{64}{10} = 6.4$ cm. (The req.)

[b] $\because$ The area of Δ AMB = the area of Δ DMC

Adding the area of Δ AMD to both sides

$\therefore$ The area of Δ ABD = the area of Δ ACD

but they have a common base $\overline{AD}$ and on one side of it

$\therefore \overline{AD} // \overline{BC}$ (Q.E.D.)

4

[a] In Δ ABC : $\because (AC)^2 = (12)^2 = 144$

, $(AB)^2 + (BC)^2 = (9)^2 + (10)^2 = 181$

$\therefore (AC)^2 < (AB)^2 + (BC)^2$

$\therefore \angle$ B is acute. (The req.)

[b] $\because \overline{AD}$ is a median in Δ ABC

$\therefore$ The area of Δ ABD = the area of Δ ACD (1)

, $\because \overline{ED}$ is a medain in Δ EBC

$\therefore$ The area of Δ EBD = the area of Δ ECD (2)

Subtracting (2) from (1) :

$\therefore$ The area of Δ ABE = the area of Δ ACE

(Q. E. D.)

5

[a] In Δ ABC : $\because$ m ($\angle$ B) = 90°

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$

$\therefore$ AC = 15 cm.

In Δ ACD : $\because (CD)^2 = (17)^2 = 289$

, $(AC)^2 + (AD)^2 = (15)^2 + (8)^2 = 289$

$\therefore (CD)^2 = (AC)^2 + (AD)^2$

$\therefore$ m ($\angle$ DAC) = 90° (Q.E.D.)

[b] In $\Delta\Delta$ AED , ABC

$\because \overline{ED} // \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal

$\therefore$ m ($\angle$ AED) = m ($\angle$ B)

(corresponding angles) (1)

, $\because \overline{ED} // \overline{BC}$, $\overleftrightarrow{AC}$ is a transversal

$\therefore$ m ($\angle$ ADE) = m ($\angle$ C)

(corresponding angles) (2)

, $\because \angle$ A is a common angle (3)

From (1) , (2) and (3) :

$\therefore \Delta AED \sim \Delta ABC$

, $\frac{AE}{AB} = \frac{ED}{BC} = \frac{AD}{AC}$ $\therefore \frac{5}{15} = \frac{4}{AC}$

$\therefore AC = \frac{4 \times 15}{5} = 12$ cm.

$\therefore DC = 12 - 4 = 8$ cm. (The req.)

13 Port Said

1

1 (c) 2 (d) 3 (a)
4 (b) 5 (d) 6 (c)

2

1 120° 2 C 3 2 : 5
4 5 5 a right

3

[a] In ΔABC : $\because m(\angle BAC) = 90°$, $\overline{AD} \perp \overline{BC}$

$\therefore (AB)^2 = BD \times BC = 16 \times 25 = 400$

$\therefore AB = 20$ cm.

, $(AC)^2 = CD \times BC = 9 \times 25 = 225$

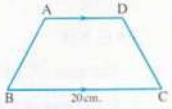
$\therefore AC = 15$ cm.

, $(AD)^2 = CD \times BD = 9 \times 16 = 144$

$\therefore AD = 12$ cm. (The req.)

[b] $\because BC = 2\,AD = 20$ cm.

$\therefore AD = 10$ cm.



, $\because$ the area of the trapezium ABCD $= \frac{1}{2}(BC + AD) \times$ the height

$\therefore 180 = \frac{1}{2}(20 + 10) \times$ the height

$\therefore 180 = 15 \times$ the height

$\therefore$ The height $= \frac{180}{15} = 12$ cm. (The req.)

4

[a] In $\Delta\Delta ABC$, DBE

$\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{AD}$ is a transversal

$\therefore m(\angle A) = m(\angle D)$ (alternate angles) (1)

$\because \overline{AC} // \overline{ED}$, $\overleftrightarrow{CE}$ is a transversal

$\therefore m(\angle C) = m(\angle E)$ (alternate angles) (2)

, $\because m(\angle ABC) = m(\angle DBE)$ (V. O. A.) (3)

From (1) , (2) and (3) :

$\therefore \Delta ABC \sim \Delta DBE$ (First req.)

, $\frac{AB}{DB} = \frac{BC}{BE} = \frac{AC}{DE}$

$\therefore \frac{3}{6} = \frac{BC}{8} = \frac{5}{DE}$ $\therefore DE = \frac{5 \times 6}{3} = 10$ cm.

, $BC = \frac{3 \times 8}{6} = 4$ cm. (Second req.)

[b] $\because \Delta\Delta AXF$, CYF have equal bases in lengths , $\overline{AC} // \overline{XY}$

$\therefore$ The area of ΔAXF = the area of ΔCYF (1)

, $\because \overline{BF}$ is a median in ΔBXY

$\therefore$ The area of ΔBXF = the area of ΔBYF (2)

Adding (1) and (2) :

$\therefore$ The area of ΔABF = the area of ΔCBF (Q.E.D.)

5

[a] $\because$ The area of ΔABE = the area of ΔACD

Subtracting the area of ΔADE from both sides

$\therefore$ The area of ΔBDE = the area of ΔCDE but they have a common base $\overline{DE}$ and on one side of it

$\therefore \overline{DE} // \overline{BC}$ (Q.E.D.)

[b] In ΔABC : $\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (9)^2 + (12)^2 = 225$

$\therefore AC = 15$ cm.

In ΔACD : $\because (CD)^2 = (17)^2 = 289$

, $(AC)^2 + (AD)^2 = (15)^2 + (8)^2 = 289$

$\therefore (CD)^2 = (AC)^2 + (AD)^2$

$\therefore m(\angle DAC) = 90°$ (Q.E.D.)

14 El-Beheira

1

1 (a) 2 (b) 3 (a)
4 (b) 5 (c) 6 (c)

2

1 40° 2 equal in measure.
3 6 4 360° 5 CD , BD

3

[a] Let the lengths of the parallel bases be :

$3X$ cm. , $5X$ cm.

$\therefore \frac{1}{2}(3X + 5X) \times 9 = 180$ $\therefore \frac{1}{2}(8X) = 20$

$\therefore 4X = 20$ $\therefore X = 5$

$\therefore$ The lengths of the parallel bases are :

15 cm. , 25 cm. (The req.)

[b] ∵ ΔΔ ABC , DBC have the common base $\overline{BC}$

, $\overline{BC} // \overline{AD}$

∴ The area of Δ ABC = the area of Δ DBC (1)

∵ $\overline{MX}$ is a median in Δ MBC

∴ The area of Δ MCX = the area of Δ MBX (2)

Subtracting (2) from (1) :

∴ The area of the shape ABXM

= the area of the shape DCXM (Q.E.D.)

4

[a] In ΔΔ AED , ABC

∵ m (∠ AED) = m (∠ B)

, ∠ A is a common angle

∴ m (∠ ADE) = m (∠ C)

∴ Δ AED ~ Δ ABC (First req.)

, $\frac{AE}{AB} = \frac{ED}{BC} = \frac{AD}{AC}$

∴ $\frac{4.5}{9} = \frac{3}{AC}$ ∴ $AC = \frac{3 \times 9}{4.5} = 6$ cm.

∴ CE = 6 – 4.5 = 1.5 cm. (Second req.)

[b] ∵ Δ EBC , ▱ ABCD have a common base $\overline{BC}$

, $E \in \overline{AD}$

∴ The area of Δ EBC = $\frac{1}{2}$ the area of ▱ ABCD (1)

∵ ▱ ABXY , ▱ ABCD have a common base $\overline{AB}$, $\overline{AB} // \overline{CY}$

∴ The area of ▱ ABXY = the area of ▱ ABCD (2)

From (1) and (2) :

∴ The area of Δ EBC = $\frac{1}{2}$ the area of ▱ ABXY (Q.E.D.)

5

[a] In Δ ABC : ∵ m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

∴ $(AC)^2 = CD \times BC = 16 \times 25 = 400$

∴ AC = 20 cm.

, $(AB)^2 = BD \times BC = 9 \times 25 = 225$

∴ AB = 15 cm.

, $AD = \frac{AC \times AB}{BC} = \frac{20 \times 15}{25} = 12$ cm. (The req.)

[b] In Δ ABC : ∵ $(BC)^2 = (10)^2 = 100$

, $(AC)^2 + (AB)^2 = (8)^2 + (7)^2 = 113$

, ∵ $(BC)^2 < (AC)^2 + (AB)^2$

∴ Δ ABC is acute-angled triangle (The req.)

15 Beni Suef

1

1 (b) 2 (b) 3 (c)

4 (a) 5 (a) 6 (c)

2

1 equal in area 2 obtuse-angled triangle

3 acute 4 180°

5 equal in measure

3

[a] ∵ Δ ABC , the rectangle ABCD have a common base $\overline{BC}$

, $A \in \overline{AD}$

∴ The area of Δ ABC

= $\frac{1}{2}$ the area of the rectangle ABCD (1)

, ∵ Δ DAE , the rectangle ABCD have a common base $\overline{AD}$

, $\overline{AD} // \overline{CE}$

∴ The area of Δ DAE

= $\frac{1}{2}$ the area of the rectangle ABCD (2)

From (1) and (2) :

∴ The area of Δ DAE = the area of Δ ABC (Q.E.D.)

[b] ∵ The area of Δ ABM = the area of Δ DCM

Adding the area of Δ ADM to both sides

∴ The area of Δ ABD = the area of Δ ACD

but they have a common base $\overline{AD}$

and on one side of it

∴ $\overline{AD} // \overline{BC}$ (Q.E.D.)

4

[a] The area = $\frac{1}{2} \times 10 \times 8 = 40$ cm^2 (The req.)

[b] In $\Delta\Delta$ ABC , AED

$\because$ m ($\angle$ B) = m ($\angle$ E) = 90°

, m ($\angle$ BAC) = m ($\angle$ EAD) (V.O.A.)

$\therefore$ m ($\angle$ C) = m ($\angle$ D)

$\therefore$ Δ ABC ~ Δ AED (Q.E.D.)

5

[a] In Δ ADC : $\because$ m ($\angle$ D) = 90°

$\therefore (AC)^2 = (AD)^2 + (CD)^2 = (15)^2 + (20)^2 = 625$

In Δ ABC : $\because (AC)^2 = 625$

$, (AB)^2 + (BC)^2 = (7)^2 + (24)^2 = 625$

$, \because (AC)^2 = (AB)^2 + (BC)^2$

$\therefore$ m ($\angle$ ABC) = 90° (Q.E.D.)

[b] $\overline{FD}$ is the projection of $\overline{BD}$ on $\overleftrightarrow{CD}$

In Δ ACE : $\because$ m ($\angle$ C) = 90°

$\therefore (CE)^2 = (AE)^2 - (AC)^2 = (20)^2 - (16)^2 = 144$

$\therefore$ CE = 12 cm. , $\because$ DE = CE

$\therefore$ DE = 12 cm.

, $\because$ Δ EBD is isosceles , $\overline{BF} \perp \overline{ED}$

$\therefore FD = \frac{1}{2} DE = \frac{1}{2} \times 12 = 6$ cm. (The req.)

Schools Examinations on Geometry

1 Cairo Governorate

El-Nozha Directorate of Education
Modern Language Schools

Answer the following questions :

1 Choose the correct answer :

1 The area of the trapezium whose middle base is of length 7 cm. and its height is 6 cm. equals .....

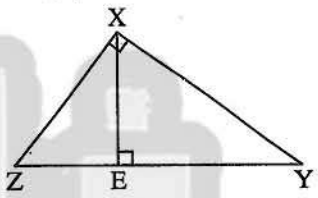
(a) 21 cm^2 (b) 40 cm^2 (c) 42 cm^2 (d) 13 cm^2

2 In ΔABC : if $m(\angle C) = 90°$, AB = 20 cm. and BC = 16 cm. , then AC = ... cm.

(a) 9 (b) 12 (c) $4\sqrt{41}$ (d) 25

3 **In the opposite figure :**

$EY \times EZ$ = ...



(a) $(XE)^2$ (b) $(XZ)^2$

(c) $(YZ)^2$ (d) $(XY)^2$

4 The triangle whose sides lengths are 5 cm. , 8 cm. and 7 cm. is .....-angled triangle.

(a) right (b) acute (c) obtuse (d) straight

5 If the triangle base length is 6 cm. and its area is 24 cm^2 , then its corresponding height is .....

(a) 18 cm. (b) 8 cm. (c) 4 cm. (d) 10 cm.

6 If $\overline{AB} \parallel \overline{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) ≥

2 Complete :

1 The two polygons are similar if their corresponding side lengths are ..... and their corresponding angle are .....

2 If $\Delta ABC \sim \Delta XYZ$, $m(\angle A) + m(\angle B) = 60°$, then $m(\angle Z)$ = ...

3 If ΔABC is an obtuse-angled triangle at B , then $(AC)^2$ ..... $(AB)^2 + (BC)^2$

4 If the length of the diagonal of a square is 10 cm. , then its area = ... cm^2

5 If the ratio between the length of two corresponding sides of two similar polygons is 2 : 5 and the perimeter of the smaller one is 12 cm. , then the perimeter of the other one is .....

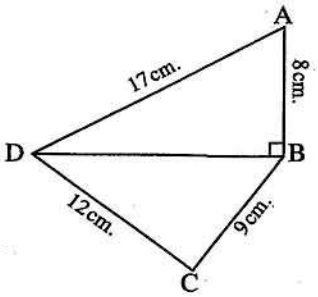
3 **[a] In the opposite figure :**

ABCD is a quadrilateral in which :

AB = 8 cm. , BC = 9 cm.

, CD = 12 cm. , AD = 17 cm.

and $\overline{DB} \perp \overline{AB}$



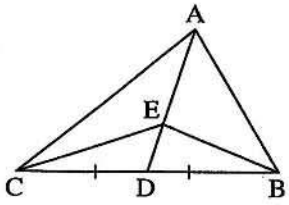
1 **Find :** the length of $\overline{BD}$

2 **Prove that :** m (∠ C) = 90°

[b] In the opposite figure :

Δ ABC with a median $\overline{AD}$, E ∈ $\overline{AD}$

Prove that : the area of Δ ABE = the area of Δ ACE

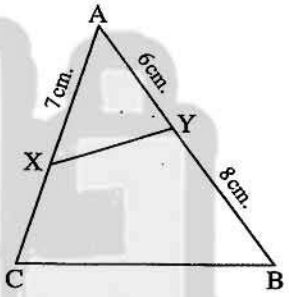


4 **[a] In the opposite figure :**

Δ AXY ~ Δ ABC , AX = 7 cm.

, AY = 6 cm. , YB = 8 cm.

Find : the length of $\overline{XC}$

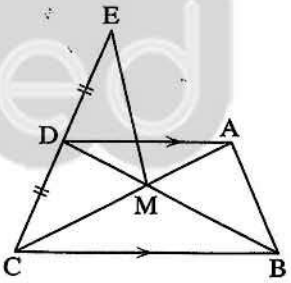


[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, D is the midpoint of $\overline{EC}$

Prove that : the area of Δ MDE = the area of Δ AMB



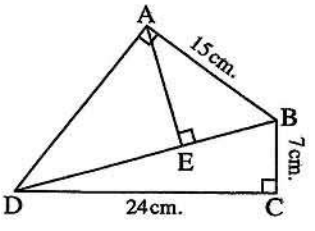
5 **In the opposite figure :**

ABCD is a quadrilateral , m (∠ BCD) = m (∠ BAD) = 90°

, $\overline{AE} \perp \overleftrightarrow{BE}$

1 **Find :** the length of $\overline{BD}$ and $\overline{AD}$

2 **Find :** the length of the projection of $\overline{AB}$ on $\overleftrightarrow{BD}$



2 Cairo Governorate

Shoubra Educational Zone

Answer the following questions :

1 Choose the correct answer :

1 In ΔABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then m ($\angle C$) is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 ABCD is a parallelogram in which m ($\angle A$) = 70° , then m ($\angle B$) = ...°

(a) 70 (b) 110 (c) 180 (d) 360

3 The diagonals of isosceles trapezium are .....

(a) parallel (b) perpendicular (c) congruent (d) not equal

4 A rhombus its two diagonals of lengths 8 cm. and 6 cm. , its area equals ..... cm^2

(a) 14 (b) 20 (c) 24 (d) 48

5 $\overline{AB} // \overleftrightarrow{CD}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$ ..... the length of $\overline{AB}$

(a) > (b) < (c) = (d) ≤

6 Any triangle has at least two ..... angles.

(a) right. (b) obtuse. (c) acute. (d) straight.

2 Complete each of the following :

1 The square of diagonal length 12 cm. , then its area = ... cm^2

2 If each of two triangles is similar to a third triangle , then they are .....

3 The median of a triangle divides it into two triangles .....

4 If $\Delta ADE \sim \Delta ABC$, AE : AC = 1 : 2 and DE = 5 cm. , then BC = ... cm.

5 Each two opposite angles in a parallelogram are .....

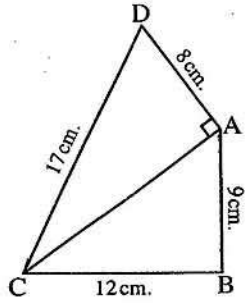
3 [a] In the opposite figure :

m ($\angle DAC$) = 90° , AD = 8 cm.

, DC = 17 cm. , AB = 9 cm.

, BC = 12 cm.

Prove that : m ($\angle B$) = 90°



[b] Find the area of a trapezium :

Whose two parallel bases lengths are 12 cm. , 7 cm. and its height is 5 cm.

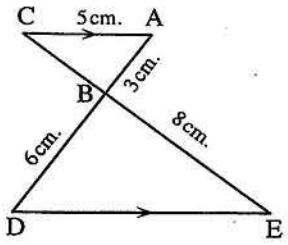
4 **[a] In the opposite figure :**

$\overline{AC} \parallel \overline{ED}$, $\overline{AD} \cap \overline{CE} = \{B\}$, AC = 5 cm.

, AB = 3 cm. and BD = 6 cm.

, BE = 8 cm.

Prove that : $\Delta ABC \sim \Delta DBE$



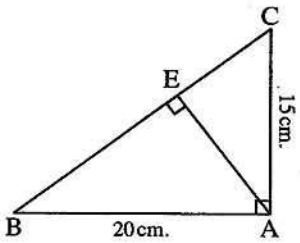
[b] In the opposite figure :

ABC is a right-angled triangle at A , $\overline{AE} \perp \overline{BC}$

Find :

1 The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$

2 The length of $\overline{EC}$

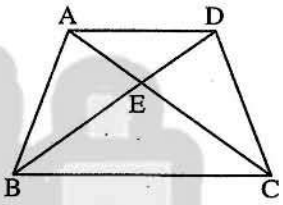


5 **[a]** Determine the type of triangle ABC according to its angles where AB = 7 cm. , BC = 6 cm. , AC = 9 cm.

[b] In the opposite figure :

The area of ΔAEB = the area of ΔDEC

Prove that : $\overline{AD} \parallel \overline{BC}$



3 Cairo Governorate

El-Zeiton Zone
Talaea Gaber El Ansary Language School

Answer the following questions :

1 **Choose the correct answer :**

1 The lengths of two adjacent sides in a parallelogram are 6 cm. , 7 cm. and the greater height is 5 cm. , then its area = ... cm^2

(a) 30 (b) 35 (c) 42 (d) 49

2 A trapezium whose middle base length is 8 cm. , then the lengths of the parallel bases may be .....

(a) 4 cm. , 4 cm. (b) 3 cm. , 5 cm. (c) 4 cm. , 6 cm. (d) 6 cm. , 10 cm.

3 A perimeter of a square is 20 cm. , then its area = ... cm.

(a) 400 (b) 80 (c) 25 (d) 20

4 In ΔABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then angle C is .....

(a) acute. (b) obtuse. (c) right. (d) straight.

5 ABC is a right-angled triangle at B , $\overline{BD} \perp \overline{AC}$, then the projection of $\overline{BD}$ on $\overleftrightarrow{AC}$ is .....

(a) A (b) B (c) C (d) D

6 The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 3 : 5 (b) 5 : 3 (c) 2 : 5 (d) 9 : 25

2 Complete the following :

1 The two polygons are similar , if their corresponding side lengths are ..... and their corresponding angles are .....

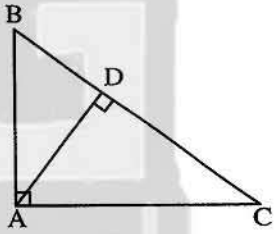
2 The area of rhombus is 12 cm^2 , if the length of one of its diagonals is 4 cm. , then the length of the other diagonal = ... cm.

3 The complement of an angle of measure 25° equals .....

4 XYZ is a triangle in which $(XY)^2 = (XZ)^2 - (ZY)^2$, then m (∠ .....) = 90°

5 A rectangle whose perimeter is 28 cm. , and its length is 8 cm. , then the length of its diagonal = ... cm.

3 [a] In the opposite figure :



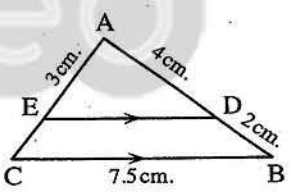
m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

Complete :

1 $(AB)^2$ = ... × .....

2 $(AD)^2$ = ... × .....

[b] In the opposite figure :

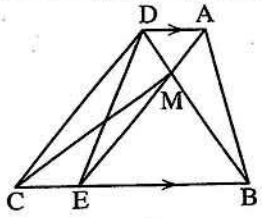


$\overline{DE} // \overline{BC}$, AD = 4 cm. , AE = 3 cm. , BD = 2 cm. and BC = 7.5 cm.

1 **Prove that :** Δ ADE ~ Δ ABC

2 **Find :** the length of $\overline{ED}$

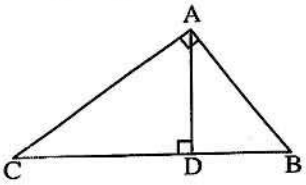
4 [a] In the opposite figure :



$\overline{AD} // \overline{BC}$, $\overline{AE} \cap \overline{BD} = \{M\}$, the area of Δ AMB = the area of Δ EMC

Prove that : $\overline{ME} // \overline{DC}$

[b] In the opposite figure :



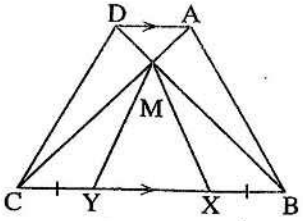
$\overline{AD} \perp \overline{CB}$, $\overline{AC} \perp \overline{AB}$

Prove that : Δ ABC ~ Δ DBA ~ Δ DAC

5 **[a] In the opposite figure :**

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, $BX = CY$



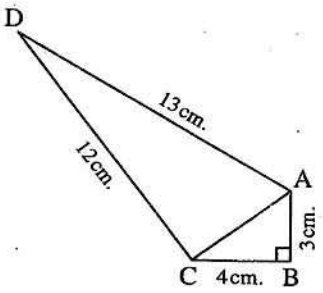
Prove that :

The area of the figure ABXM = The area of a figure DCYM

[b] In the opposite figure :

$BC = 4$ cm. , $AD = 13$ cm.

, $AB = 3$ cm. , $DC = 12$ cm. , $m(\angle B) = 90°$



1 **Find :** The length of $\overline{AC}$

2 **Prove that :** $m(\angle ACD) = 90°$

4 Giza Governorate

Omrania Directorate
El-Sadat Governmental Language School

Answer the following questions :

1 **Choose the correct answer :**

1 In ΔABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then $\angle C$ is .....

(a) acute. (b) right. (c) obtusc. (d) straight.

2 A rhombus whose diagonal lengths are 6 cm. , 10 cm. its area = ... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

3 If the length of the middle base of a trapezium is 8 cm. and its surface area is 56 cm^2 , then its height = ... cm.

(a) 32 (b) 24 (c) 448 (d) 7

4 If the ratio of an enlargement between two triangles equals 1 , then the two triangles are .....

(a) congruent. (b) enlargement. (c) coincidc. (d) reduction.

5 Any triangle has at least two ..... angles.

(a) right. (b) obtuse. (c) acute. (d) straight.

6 The isosceles triangle has ..... axis of symmetry.

(a) zero (b) one (c) two (d) three

2 **Complete each of the following :**

1 The median of a triangle divides it into two triangles ..... in area.

2 Two triangles are similar if their corresponding side lengths are .....

[3] ABCD is a rectangle , the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

[4] Surfaces of two parallelograms with common base and between two parallel straight lines one is carrying this base are .....

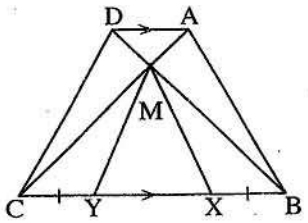
[5] ABCD is a parallelogram its area = 36 cm^2 , $E \in \overline{AD}$, then the area of Δ EBC = ... cm^2

3 **[a] In the opposite figure :**

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, $X \in \overline{BC}$, $Y \in \overline{BC}$ such that BX = CY

Prove that : the area of shape ABXM = the area of shape DCYM

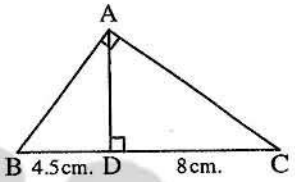


[b] In the opposite figure :

ABC is a triangle in which : m ($\angle$ A) = 90° , $\overline{AD} \perp \overline{BC}$

, BD = 4.5 cm. , DC = 8 cm.

Find : the length of each of $\overline{AC}$, $\overline{AB}$, $\overline{AD}$



4 **[a] In the opposite figure :**

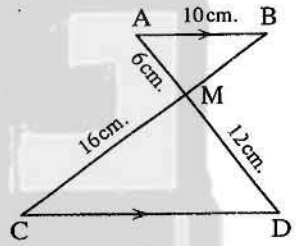
$\overline{AB} // \overline{DC}$, $\overline{AD} \cap \overline{BC} = \{M\}$

, AB = 10 cm. , AM = 6 cm.

, MD = 12 cm. , MC = 16 cm.

[1] **Prove that :** Δ AMB ~ Δ DMC

[2] **Find :** the length of $\overline{CD}$, $\overline{MB}$



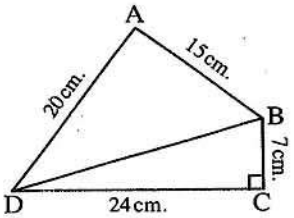
[b] Identify the type of Δ ABC according to the measures of its angles where AB = 5 cm. , BC = 6 cm. , AC = 7 cm.

5 **[a] In the opposite figure :**

m ($\angle$ BCD) = 90° , AB = 15 cm.

, BC = 7 cm. , CD = 24 cm. , AD = 20 cm.

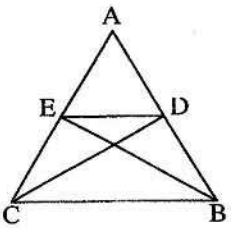
Prove that : m ($\angle$ BAD) = 90°



[b] In the opposite figure :

If the area of Δ ADC = the area of Δ AEB

Prove that : $\overline{DE} // \overline{BC}$



5 Giza Governorate

Abo El-Nomoros Directorate
Inspection of maths

Answer the following questions :

1 Complete each of the following :

1 The two triangles are similar if their corresponding sides are .....

2 In ΔABC , if $(AC)^2 + (BC)^2 = (AB)^2$, then m ($\angle$ .....) = 90°

3 A square its side length is 5 cm. , then its diagonal length = ... cm.

4 If $\overline{AB} \perp \overline{BC}$, then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

5 A rhombus its diagonal lengths are 8 cm. and 7 cm. , then its area = ... cm^2

2 Choose the correct answer :

1 If the two similar triangles are congruent , then the ratio of enlargement = ...

(a) 1 (b) 2 (c) 0.5 (d) 0.25

2 A triangle its side lengths are 3 cm. , 4 cm. and 5 cm. , then its area = ... cm^2

(a) 12 (b) 6 (c) 10 (d) 15

3 A parallelogram its area is 27 cm^2 , if its base length three times its height , then its height = ... cm.

(a) 27 (b) 9 (c) 3 (d) 6

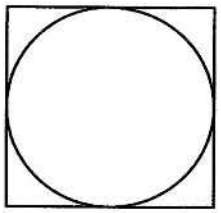
4 If the measure of the smallest angle of a triangle is 20° , then the possible measure of the greatest angle in this triangle = ...°

(a) 90 (b) 140 (c) 159 (d) 160

5 The suitable unit to measure the height of a house is .....

(a) cm. (b) dm. (c) m. (d) km.

6 If the area of the opposite square = 36 cm^2 , then the area of the circle = ... cm^2



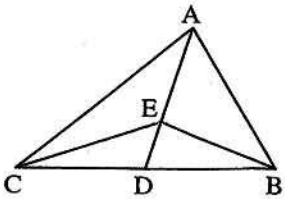
(a) 6 π (b) 9 π

(c) 36 π (d) 9

3 [a] In the opposite figure :

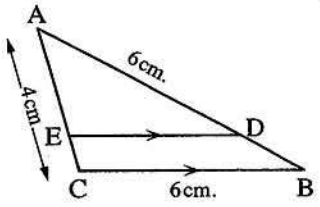
ABC is a triangle in which , $\overline{AD}$ is median , $E \in \overline{AD}$

Prove that : the area of ΔABE = the area of ΔACE



[b] Determine the type of Δ ABC according to its angles if
AB = 7 cm. , BC = 3 cm. and AC = 5 cm.

4 **[a] In the opposite figure :**



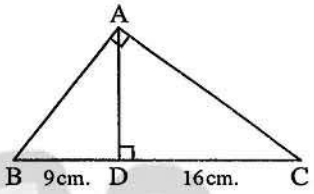
$\overline{DE}$ // $\overline{BC}$, AD = BC = 6 cm.
, AB = 8 cm. , AC = 4 cm.

1 **Prove that :** Δ ADE ~ Δ ABC

2 **Find :** the lengths of $\overline{AE}$ and $\overline{DE}$

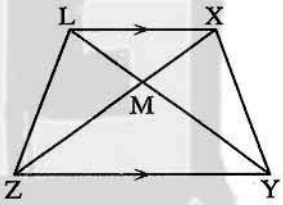
[b] Find the area of a trapezium if the lengths of its parallel bases are 5 cm. , 9 cm. and its height is 4 cm.

5 **[a] In the opposite figure :**



ABC is a right-angled triangle at A
, $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm.
Find : the length of $\overline{AC}$, $\overline{AB}$ and $\overline{AD}$

[b] In the opposite figure :



XYZL is a trapezium in which
, $\overline{XL}$ // $\overline{YZ}$, $\overline{XZ} \cap \overline{LY} = \{M\}$
Prove that : the area of Δ XMY = the area of Δ LMZ

6 Alexandria Governorate

West Educational zone
Inspectorate of Mathematics

Answer the following questions :

1 **Complete each of the following :**

1 The area of the rhombus whose diagonal lengths are12 cm. , 8 cm. equals ..... cm^2

2 If $\overline{AD} \perp \overline{BC}$, then the length of projection of $\overline{AD}$ on $\overleftrightarrow{BC}$ equals ..... cm.

3 Δ ABC is a right-angled triangle at B in which AB = 5 cm. , BC = 12 cm.
, then AC = ... cm.

4 In Δ ABC : AB = 8 cm. , BC = 9 cm. and AC = 6 cm. , then the type of this triangle according to its angles is .....

5 The number of axes of symmetry of an isosceles triangle equals .....

2 Choose the correct answer :

1 The diagonals of an isosceles trapezium are .....

(a) congruent. (b) perpendicular.

(c) bisect each other. (d) parallel.

2 If the ratio between two corresponding sides of two similar triangles is 1 : 2 , and the measure of an angle of the first triangle equals 60° , then the measure of its corresponding angle in the other triangle equals .....

(a) 30° (b) 120° (c) 60° (d) 62°

3 The image of point (2 , 0) is itself by reflection on .....

(a) $\mathcal{X}$-axis (b) y-aixs

(c) origin point. (d) $\mathcal{X}$-axis followed by y-axis

4 The perpendicular segment drawn from the right angle of a triangle to the hypotenuse divides it into two ..... triangles.

(a) obtuse angle (b) acute angle

(c) equelateral (d) similar

5 The measure of the complementary angle of an angle whose measure $\mathcal{X}°$ equals .....

(a) 90° (b) $90° - \mathcal{X}°$ (c) $\mathcal{X}° - 90°$ (d) $90\ \mathcal{X}°$

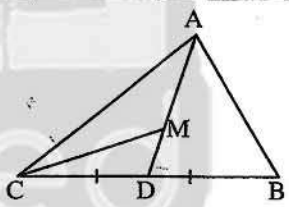
6 ABCD is a parallelogram , $E \in BC$, then the area of $\square$ ABCD = ... area of Δ EAD

(a) the same (b) half (c) twice (d) third

3 [a] In the opposite figure :

Δ ABC , M is the point of concurrence

Prove that : the area of Δ AMC = $\frac{1}{3}$ the area of Δ ABC

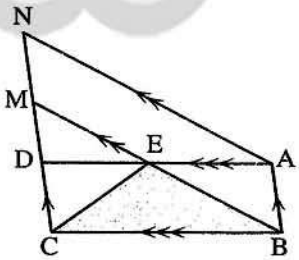


[b] In the opposite figure :

ABCD and ABMN are two parallelograms

Prove that :

The area of Δ EBC = $\frac{1}{2}$ the area of $\square$ ABMN



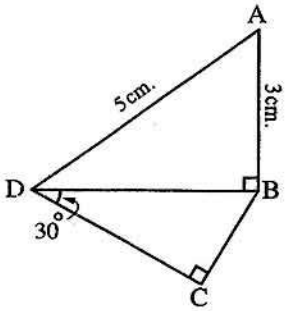
4 [a] In the opposite figure :

ABCD is a quadrilateral in which :

m ($\angle$ ABD) = 90° , m ($\angle$ BCD) = 90°

, m ($\angle$ BDC) = 30° , AB = 3 cm. , AD = 5 cm.

Find : the lengths of $\overline{BD}$ and $\overline{BC}$



[b] In the opposite figure :

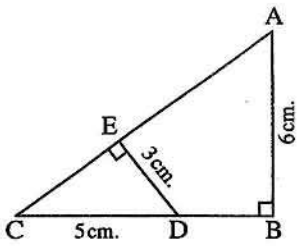
ABC is a right-angled triangle at B

, $\overline{DE} \perp \overline{AC}$, AB = 6 cm.

, ED = 3 cm. , CD = 5 cm.

1 **Prove that :** $\Delta ABC \sim \Delta DEC$

2 **Find :** the length of $\overline{AC}$



5 **[a]** The area of a trapezium is 88 cm^2 , its height is 8 cm. and the length of one of the two parallel bases is 10 cm. find the length of the other base.

[b] In the opposite figure :

m (∠ ABD) = 90° , $\overline{CE} \perp \overline{AB}$

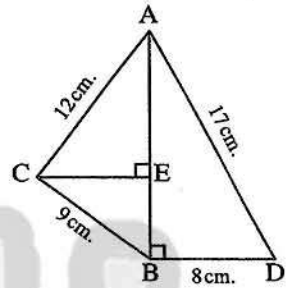
, CB = 9 cm. , AD = 17 cm.

, BD = 8 cm. , AC = 12 cm.

1 **Find :** the length of $\overline{AB}$

2 **Prove that :** m (∠ ACB) = 90°

3 **Find :** the length of the projection of $\overline{AC}$ on $\overleftrightarrow{AB}$



7 Alexandria Governorate

El Montazah Directorate
Brilliance Language School

Answer the following questions :

1 **Complete each of the following :**

1 If the area of a rhombus equals 30 cm^2 and the length of one of its diagonals equals 6 cm. , then the length of the other diagonal equals ..... cm.

2 Surface area of two parallelograms with common base and between two parallel straight lines , one is carrying this base , are .....

3 If $\overline{AB} \perp \overleftrightarrow{CD}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$ equals ..... cm.

4 In ΔABC , AB = 8 cm. , BC = 9 cm. and AC = 6 cm. , then its type according to its angles is .....

5 If two straight lines intersect , then each two vertically opposite angles are .....

2 **Choose the correct answer :**

1 The median of triangle divides its surface into two triangles .....

(a) congruent. (b) equal in area. (c) similar. (d) coincident.

2 The isosceles trapezium has ..... axis of symmetry.

(a) 1 (b) 2 (c) 3 (d) 0

3 Area of a parallelogram = 24 cm^2 and its base length is 6 cm.
, then its corresponding height = ... cm.

(a) 8 (b) 4 (c) 48 (d) 12

4 If the ratio of enlargement between two similar triangles equals 1 , then the two triangles are .....

(a) congruent. (b) different. (c) right-angled. (d) parallel.

5 The number of diagonals of any triangle = ...

(a) 4 (b) 0 (c) 2 (d) 1

6 If $\Delta ABC \sim \Delta XYZ$, then m ($\angle B$) = m ($\angle$ .....)

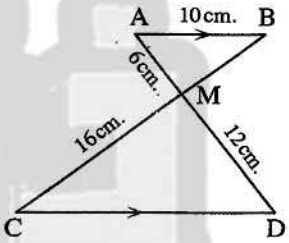
(a) C (b) Z (c) X (d) Y

3 [a] In the opposite figure :

$\overline{AB} // \overline{DC}$, $\overline{AD} \cap \overline{BC} = \{M\}$

, AB = 10 cm. , AM = 6 cm.

, MD = 12 cm. , MC = 16 cm.



1 **Prove that :** $\Delta AMB \sim \Delta DMC$

2 **Find :** the length of $\overline{CD}$

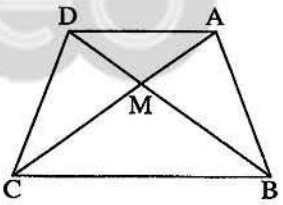
[b] In the opposite figure :

ABCD is a quadrilateral

, its diagonals intersect at M

and the area of ΔABM = the area of ΔDCM

Prove that : $\overline{AD} // \overline{BC}$



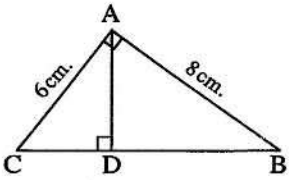
4 [a] In the opposite figure :

ABC is a triangle in which :

m ($\angle BAC$) = 90° , $\overline{AD} \perp \overline{BC}$

, AB = 8 cm. and AC = 6 cm.

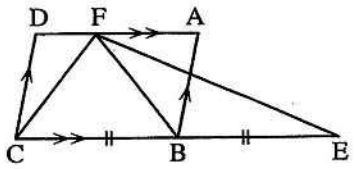
Find : the lengths of $\overline{CB}$, $\overline{CD}$ and $\overline{AD}$



[b] In the opposite figure :

ABCD is a parallelogram

, $E \in \overrightarrow{CB}$ where BC = BE



Prove that : the area of Δ FEC = the area of ▱ ABCD

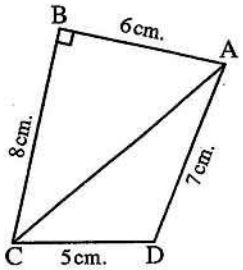
5 **[a]** Find the height of a trapezium with area of 450 cm^2 and the two parallel base lengths are 24 cm. and 12 cm.

[b] In the opposite figure :

ABCD is a quadrilateral in which : m (∠ B) = 90°

, AB = 6 cm. , BC = 8 cm. , AD = 7 cm.

and DC = 5 cm.



Determine the type of the angle which has the greatest measure in Δ ACD

8 El-Kalyoubia Governorate

Math's Inspection

Answer the following questions :

1 **Choose the correct answer :**

1 ABCD is a parallelogram in which m (∠ A) = 70° , then m (∠ B) = ... °

(a) 70 (b) 110 (c) 180 (d) 360

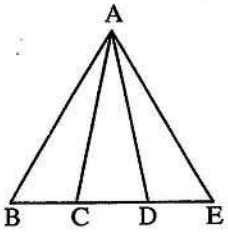
2 A rhombus whose diagonal lengths are 6 cm. and 10 cm. and its area = ... cm^2

(a) 60 (b) 30 (c) 15 (d) 10

3 A square of perimeter 20 cm. , then its area = ... cm^2

(a) 20 (b) 25 (c) 50 (d) 100

4 The number of the triangles in the opposite figure = ...



(a) 3 (b) 4

(c) 5 (d) 6

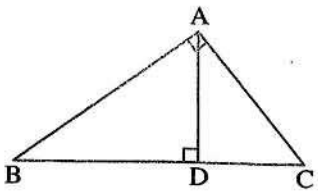
5 All the ..... are similar.

(a) squares (b) triangles (c) rectangles (d) parallelograms

6 If Δ ABC ~ Δ XYZ , then m (∠ Y) = m (∠ .....)

(a) A (b) B (c) C (d) X

2 **Complete each of the following :**



1 In the opposite figure

$AB \times$ ..... $= BC \times AD$

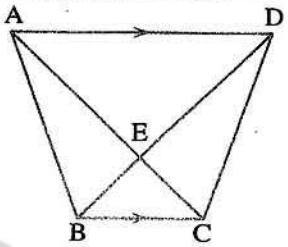
2 In ΔABC , if $(AC)^2 + (BC)^2 = (AB)^2$, then m ($\angle$ .....) $= 90°$

3 If the point A $\in$ the straight line L , then the projection of the point A on the straight line L is .....

4 The area of the triangle $= \frac{1}{2} \times$ ..... $\times$ the corresponding height.

5 The diagonals of an isosceles trapezium are ..... in the length.

3 **[a] In the opposite figure :**



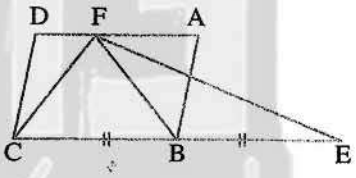
ABCD is a quadrilateral in which

, $\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{E\}$

Prove that : the area of ΔABE = the area of ΔDCE

[b] The side lengths of one of two similar triangles are 3 cm. , 4 cm. , 5 cm. and the perimeter of the other triangle is 36 cm. Find the side lengths of the other triangle.

4 **[a] In the opposite figure :**

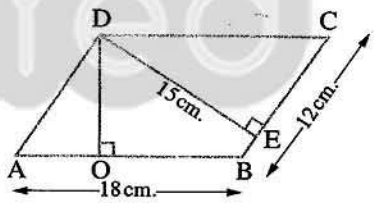


ABCD is a parallelogram , $E \in \overrightarrow{CB}$, where BC = BE

Prove that :

The area of ΔFCE = the area of parallelogram ABCD

[b] In the opposite figure :



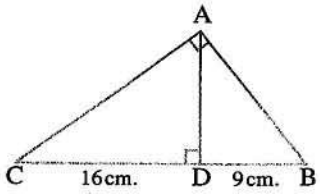
ABCD is a parallelogram in which :

AB = 18 cm. , DE = 15 cm. , and BC = 12 cm.

, $\overline{DE} \perp \overline{BC}$, $\overline{DO} \perp \overline{AB}$

Calculate the area of $\square ABCD$, and find the length of $\overline{DO}$

5 **[a] In the opposite figure :**



ABC is a right-angled triangle at A

, $\overline{AD} \perp \overline{BC}$, if BD = 9 cm. and DC = 16 cm.

Find : the lengths of $\overline{AB}$ and $\overline{AD}$

[b] In ΔABC , if AB = 3 cm. , BC = 7 cm. , AC = 5 cm.

Determine the type of ΔABC according to its angles.

9 El-Sharkia Governorate

Dep. of formal L. Schools

Answer the following questions :

1 Complete each of the following :

1. The median of a triangle divides its surface into .....
2. The area of a trapezium whose parallel base lengths are 10 cm. , 6 cm. and its height is 5 cm. is ..... cm^2
3. Area of parallelogram = ... × .....
4. The area of the rhombus of perimeter 20 cm. and height 3 cm. = ...
5. The area of a triangle is equal to ..... the area of a parallelogram if they have a common base lying on one of two parallel straight lines including them.

2 Choose the correct answer :

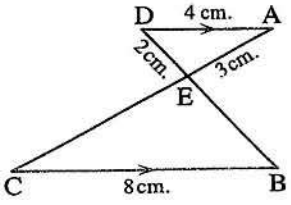
1. ABC is a triangle in which $(AB)^2 > (AC)^2 + (BC)^2$, then $\angle C$ is .....
   (a) acute. (b) right. (c) obtuse. (d) straight.
2. If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... length of $\overline{AB}$
   (a) < (b) > (c) = (d) ≥
3. A square of diagonal length 12 cm. , then its area = ... cm^2
   (a) 24 (b) 36 (c) 48 (d) 72
4. The two base angles of the isosceles trapezium are .....
   (a) congruent. (b) complementary. (c) supplementary. (d) parallel.
5. The ratio between the lengths of corresponding sides of two similar triangles is 3 : 5 , if the perimeter of the greater triangle is 60 cm. , then the perimeter of the smaller triangle is .....
   (a) 24 (b) 36 (c) 40 (d) 100
6. A triangle whose area is 15 cm^2 and its height is 3 cm. , then its base length = ... cm.
   (a) 5 (b) 10 (c) 15 (d) 3

3 [a] In the opposite figure :

$\overline{AD} \parallel \overline{BC}$, AD = 4 cm. , BC = 8 cm.

, AE = 3 cm. and ED = 2 cm.

1. **Prove that :** $\Delta AED \sim \Delta CEB$
2. **Find :** The perimeter of ΔEBC



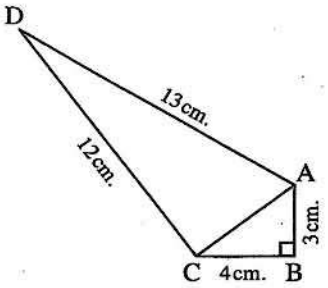
[b] In the opposite figure :

AB = 3 cm. , BC = 4 cm.

, AD = 13 cm. , CD = 12 cm.

, m (∠ B) = 90°

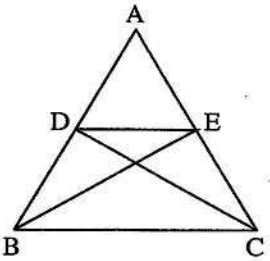
Prove that : m (∠ ACD) = 90°



4 **[a] In the opposite figure :**

If the area of Δ ACD = the area of Δ ABE

Prove that : $\overline{ED}$ // $\overline{BC}$



[b] In Δ ABC , if AB = 8 cm. , BC = 10 cm. and CA = 7 cm.

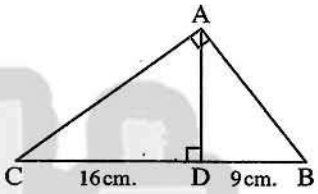
What is the type of Δ ABC according to its angles ?

5 **[a] In the opposite figure :**

ABC is a right-angled triangle at A

, $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm.

Find: The length of each of $\overline{AB}$, $\overline{AC}$, $\overline{AD}$

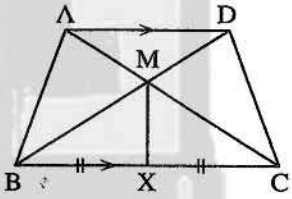


[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, X is the midpoint of $\overline{BC}$

Prove that :

The area of the figure ABXM = the area of the figure DCXM



10 El-Dakahlia Governorate

Directorate of Education
Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 The area of a rhombus whose diagonal lengths are 6 cm. and 10 cm. is ..... cm^2

(a) 60 (b) 120 (c) 30 (d) 15

2 In Δ XYZ , if $(XZ)^2 = (XY)^2 - (ZY)^2$, then ∠ Z is ..... angle.

(a) an acute. (b) a straight. (c) an obtuse. (d) a right.

3 If the perimeter of a square is 20 cm. , then its area = ... cm^2

(a) 400 (b) 10 (c) 25 (d) 12.5

4 If Δ ABC ~ Δ XYZ , then m (∠ ACB) = m (∠ .....)

(a) XYZ (b) YXZ (c) ZYX (d) XZY

5 If the diameter length of a circle = 14 cm. , then its area = ... cm^2

(a) 154 (b) 44 (c) 616 (d) 22

6 In ΔABC , $m(\angle B) = 90°$, $\overline{BD} \perp \overline{AC}$, then $(AB)^2 = AD \times$ .....

(a) AC (b) CD (c) BC (d) AD

2 Complete each of the following :

1 If the area of a square is 50 cm^2 , then its diagonal length = ...

2 Two polygons are similar if the corresponding sides are .....

3 If A $\in$ straight line L , then its projection on straight line L is .....

4 ABCD is a parallelogram , if $m(\angle A) = 80°$, then $m(\angle B)$ = ...

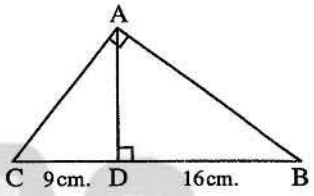
5 If the perimeter of an equilateral triangle is 30 cm. and its height is 5 cm. , then its area = ... cm^2

3 [a] In the opposite figure :

$m(\angle A) = 90°$, $\overline{AD} \perp \overline{BC}$

, CD = 9 cm. and DB = 16 cm.

Find : AC and AD

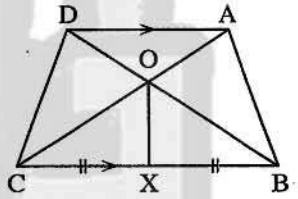


[b] In the opposite figure :

$\overline{DA} // \overline{CB}$, XB = XC

Prove that :

the area of the figure ABXO = the area of the figure DCXO



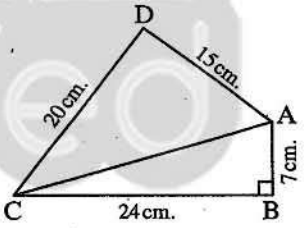
4 [a] In the opposite figure :

$m(\angle B) = 90°$, AB = 7 cm.

BC = 24 cm. and AD = 15 cm.

, CD = 20 cm.

Prove that : $m(\angle D) = 90°$



[b] In ΔABC , AB = 5 cm. , BC = 8 cm. and AC = 10 cm.

What is the type of the triangle according to its angles ? (write steps)

5 [a] A trapezium , the lengths of the two parallel bases are 4 cm. and 10 cm. , if its height is 5 cm. Calculate its middle base and its area.

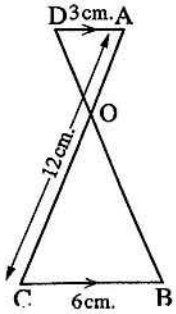
[b] In the opposite figure :

$\overline{DA} // \overline{CB}$, AD = 3 cm. and BC = 6 cm.

, AC = 12 cm.

1 **Prove that :** $\Delta AOD \sim \Delta COB$

2 **Find :** the length of $\overline{AO}$



11 Suez Governorate

Directorate of Education
Inspection of Mathematics

Answer the following questions :

1 Choose the correct answer :

1 ABCD is a parallelogram in which m (∠ A) = 70° , then m (∠ B) = ...

(a) 70° (b) 110° (c) 180° (d) 540°

2 In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then angle C is .....

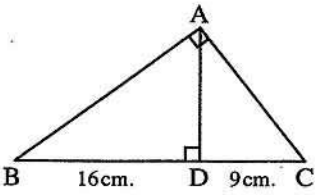
(a) acute. (b) right. (c) obtuse. (d) straight.

3 **In the opposite figure :**

m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

, DC = 9 cm. , DB = 16 cm.

, then AD = ... cm.



(a) 144 (b) 25 (c) 50 (d) 12

4 The area of the square whose diagonal length is 10 cm. = ...

(a) 100 cm^2 (b) 50 cm^2 (c) 40 cm^2 (d) 20 cm^2

5 A trapezium whose lengths of two parallel bases are 6 cm. and 8 cm. , then the length of its middle base equals ..... cm.

(a) 48 (b) 24 (c) 14 (d) 7

6 The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

2 Complete each of the following :

1 The median of a triangle divides its surface into two triangular surfaces equals .....

2 In Δ ABC , if $(AC)^2 + (BC)^2 = (AB)^2$, then m (∠ .....) = 90°

3 All the regular polygons that have the same number of sides are .....

4 The area of rhombus is 24 cm^2 , if the length of one of its diagonals 8 cm. , then the length of the other diagonal is .....

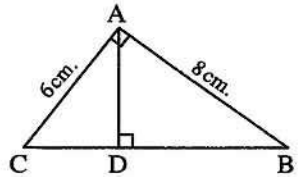
5 If the point A ∈ the striaght line L , then the projection of the point A on the line L is .....

3 [a] In the opposite figure :

m (∠ CAB) = 90° , $\overline{AD} \perp \overline{BC}$

, AC = 6 cm. , AB = 8 cm.

Find : the length of the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$

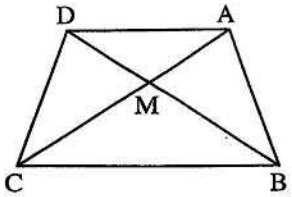


[b] In the opposite figure :

ABCD is a quadrilateral ,

the area of Δ AMB = the area of Δ DMC

Prove that : $\overline{AD}$ // $\overline{BC}$



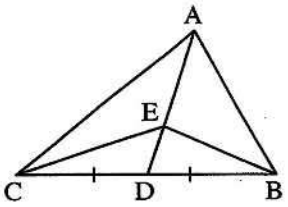
4 **[a]** Determine the type of the greatest angle in Δ ABC where AB = 9 cm. , BC = 10 cm. , AC = 12 cm.

[b] In the opposite figure :

$\overline{AD}$ is the median of Δ ABC , E ∈ $\overline{AD}$

Prove that :

The area of Δ ABE = the area of Δ ACE



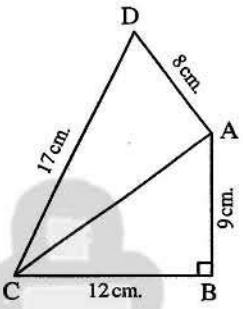
5 **[a] In the opposite figure :**

m (∠ B) = 90° , AB = 9 cm.

, BC = 12 cm. , AD = 8 cm.

, DC = 17 cm.

Prove that : m (∠ DAC) = 90°

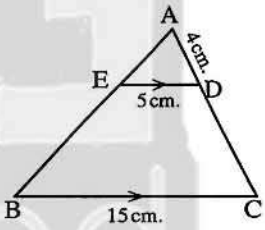


[b] In the opposite figure :

$\overline{ED}$ // $\overline{BC}$, AD = 4 cm.

, ED = 5 cm. , BC = 15 cm.

Find with proof : The length of $\overline{DC}$



12 Port Said Governorate

East Educational Directorate
mathematics Inspection

Answer the following questions :

1 **Choose the correct answer :**

1 In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 If the lengths of the diagonals of a rhombus are 6 cm. and 8 cm.
, then its perimeter = ... cm.

(a) 24 (b) 28 (c) 14 (d) 20

3 If ABCD is a parallelogram of area 20 cm^2 and E ∈ $\overline{AD}$
, then the area of Δ EBC = ... cm^2

(a) 10 (b) 5 (c) 20 (d) 40

4 If the projection of a line segment on a straight line is a point , then the line segment ..... straight line.

(a) // (b) ⊥ (c) ≡ (d) ⊂

5 The two triangles drawn on a common base and their vertices located on straight line parallel to the base are .....

(a) congruent. (b) similar.

(c) equal in perimeter. (d) equal in area.

6 ABCD is a parallelogram in which , AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its greater height = ... cm.

(a) 2 (b) 4 (c) 8 (d) 10

2 Complete each of the following :

1 If ∠ A complements ∠ B and ∠ B supplements ∠ C , if m (∠ A) = 30° , then m (∠ C) = ...°

2 In Δ ABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then m (∠ .....) = 90°

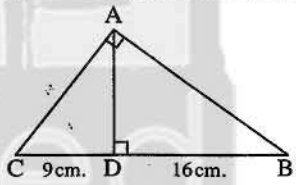
3 If two polygons are similar and the ratio between the lengths of two corresponding sides is 2 : 5 , then the ratio between their perimeters is .....

4 A trapezium whose base lengths are 4 cm. and 6 cm. , then the length of its middle base = ... cm.

5 The rectangle is a parallelogram in which one of its angles is .....

3 [a] In the opposite figure :

Find : the length of $\overline{AB}$, $\overline{AC}$ and $\overline{AD}$



[b] ABCD is a trapezium in which $\overline{AD}$ // $\overline{BC}$, if BC = 2 AD = 20 cm. and its area = 180 cm^2. Find its height.

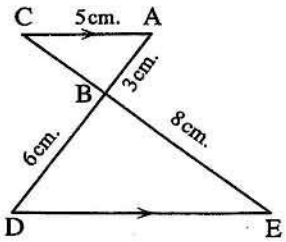
4 [a] In the opposite figure :

$\overline{AC}$ // $\overline{ED}$, AB = 3 cm. , BD = 6 cm.

, AC = 5 cm. , BE = 8 cm.

Prove that : Δ ABC ~ Δ DBE

, then find : the length of $\overline{ED}$, $\overline{BC}$

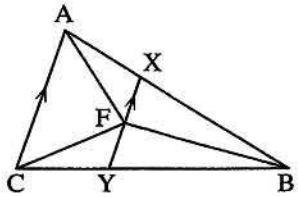


[b] **In the opposite figure :**

$\overline{AC}$ // $\overline{XY}$ and F is the midpoint of $\overline{XY}$

Prove that :

The area of Δ ABF = the area of Δ CBF



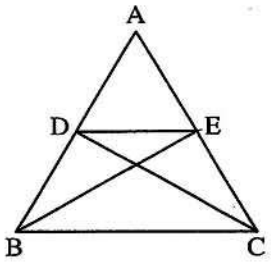
5 **[a] In the opposite figure :**

ABC is a triangle in which :

$D \in \overline{AB}$ and $E \in \overline{AC}$

, such that the area of ΔABE = the area of ΔACD

Prove that : $\overline{DE} // \overline{BC}$



[b] In the opposite figure :

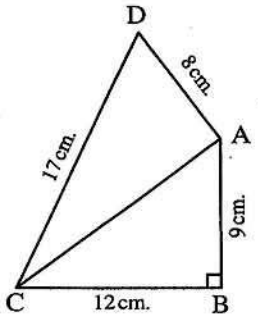
ABCD is a quadrilateral

, $m(\angle B) = 90°$, $AB = 9$ cm.

, $BC = 12$ cm. , $CD = 17$ cm.

and $DA = 8$ cm.

Prove that : $m(\angle DAC) = 90°$



13 Damietta Governorate

Damietta Inspection of Mathematic
Official Language Schools

Answer the following questions :

1 **Choose the correct answer :**

1 If the lengths of two adjacent sides in a parallelogram are 8 cm. and 10 cm. and the smaller height is 5 cm. , then its area is ..... cm^2.

(a) 40 (b) 50 (c) 80 (d) 20

2 If the area of a square is 72 cm^2. , then its diagonal length = ... cm.

(a) 6 (b) 8 (c) 12 (d) 36

3 All ..... are similar.

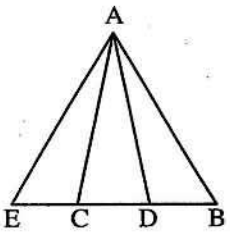
(a) squares (b) triangles (c) rectangles (d) parallelograms

4 **In the opposite figure :**

The number of the triangles = ...

(a) 3 (b) 4

(c) 5 (d) 6



5 In ΔABC , if $(AC)^2 + (BC)^2 = (AB)^2 - 5$, then $\angle C$ is ..... angle.

(a) acute (b) right (c) obtuse (d) straight

6 If the projection of a line segment on a straight line is a point , then the line segment ..... straight line.

(a) // (b) $\perp$ (c) $\equiv$ (d) $\subset$

2 Complete each of the following :

1 The area of a triangle is equal to ..... the area of the parallelogram if they have a common base lying on one of two parallel sraight lines including them.

2 If $\Delta ABC \sim \Delta DEH$ where $m(\angle A) = 70°$, $m(\angle E) = 50°$, then $m(\angle C) =$ .....°

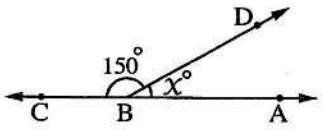
3 ABCD is a parallelogram in which $m(\angle A) + m(\angle C) = 140°$, then $(\angle B) =$ .....°

4 The length of the projection of a line segment parallel to a given straight line on this straight line is ..... the length of the original line segment.

5 **In the opposite figure :**

If $B \in \overleftrightarrow{AC}$

, then $x =$ .....°



3 **[a]** Find the height of a trapezium with area of 450 cm^2 and the two parallel bases lengths are 24 cm. and 12 cm.

[b] In the opposite figure :

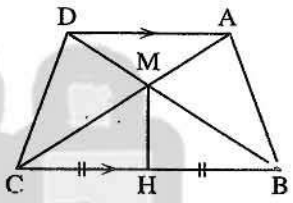
$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

and H is the midpoint of $\overline{BC}$

Prove that :

1 The area of ΔAMB = the area of ΔDMC

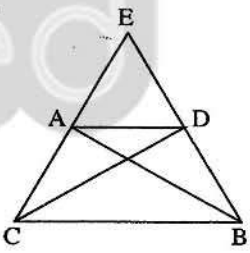
2 The area of the figure ABHM = The area of the figure DCHM



4 **[a] In the opposite figure :**

The area of ΔEAB = the area of ΔEDC

Prove that : $\overline{AD} // \overline{BC}$



[b] Determine the type of ΔABC according to its angles if

AB = 7 cm. , BC = 3 cm. , AC = 6 cm.

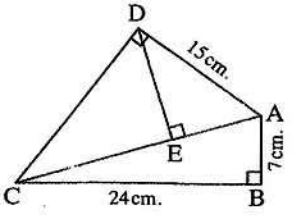
5 **[a] In the opposite figure :**

$m(\angle ADC) = m(\angle ABC) = 90°$, AB = 7 cm.

, BC = 24 cm. , AD = 15 cm.

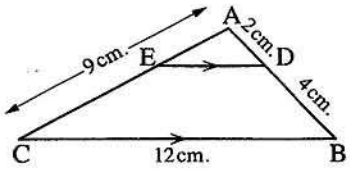
Find : 1 The length of $\overline{AC}$ and $\overline{DC}$

2 The length of the projection of $\overline{AD}$ on $\overleftrightarrow{AC}$



[b] In the opposite figure :

ABC is a triangle , AD = 2 cm. , DB = 4 cm. , BC = 12 cm. , AC = 9 cm. and $\overline{DE}$ // $\overline{BC}$



1 **Prove that :** Δ ADE ~ Δ ABC

2 **Find :** The length of $\overline{DE}$ and $\overline{AE}$

14 Beni Suef Governorate

Directorate of official Language Schools
Education administration

Answer the following questions :

1 Choose the correct answer :

1 If the lengths of two adjacent sides of a parallelogram are 8 cm. and 10 cm. and its greater height is 5 cm. , then its area equals ..... cm^2

(a) 18 (b) 40 (c) 50 (d) 80

2 The median of the triangle divides its surface into two triangles .....

(a) congruent. (b) equal in area. (c) isosceles. (d) right-angled.

3 If $\overline{AB}$ // $\overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) ≤

4 In Δ ABC , $(AC)^2 = (BC)^2 - (AB)^2$, then ∠ A is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

5 Any triangle has at least two ..... angles.

(a) acute (b) obtuse (c) right (d) reflex

6 The number of axes of symmetry of an isosceles triangle = ...

(a) zero (b) 1 (c) 2 (d) 3

2 Complete each of the following :

1 If two triangles are equal in area and drawn on the same base and on one side of it , then their vertices .....

2 If two polygons are similar , then the corresponding ..... are equal in measure.

3 A triangle whose side lengths are 9 cm. , 12 cm. and 16 cm. , then its type according to its angles is .....

4 In Δ XYZ , if $(XZ)^2 + (YZ)^2 > (XY)^2$, then the type of the angle Z is .....

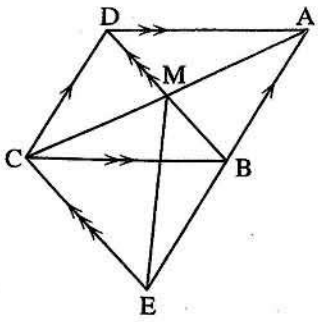
5 If a straight line intersects two parallel straight lines , then every two alternate angles are .....

3 **[a] In the opposite figure :**

ABCD and BECD are two parallelograms where $\overline{AC} \cap \overline{BD} = \{M\}$

Prove that :

The area of Δ ABD = the area of Δ MEC

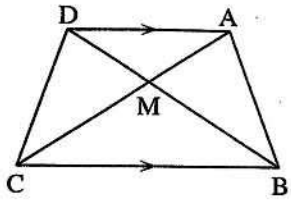


[b] In the opposite figure :

ABCD is a quadrilateral , $\overline{AD} // \overline{BC}$ and $\overline{AC} \cap \overline{BD} = \{M\}$

Prove that :

The area of Δ ABM = the area of Δ DCM



4 **[a]** Two pieces of land have equal areas , one of them has the shape of a rhombus whose diagonals lengths are 18 m. and 24 m. , and the other one has the shape of a trapzium whose height is 12 m. Find the length of its middle base.

[b] In the opposite figure :

Δ ABC , $D \in \overline{AB}$, $E \in \overline{AC}$

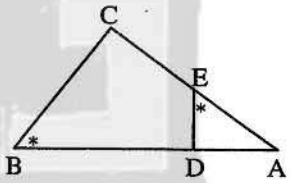
, AE = 4 cm. , EC = 5 cm.

, BC = 7.5 cm. , AD = 3 cm.

and m ($\angle$ AED) = m ($\angle$ B)

1 **Prove that :** Δ AED $\sim$ Δ ABC

2 **Find the length of :** $\overline{BD}$



5 **In the opposite figure :**

$\overline{DE} \perp \overline{AB}$, m ($\angle$ ABC) = 90°

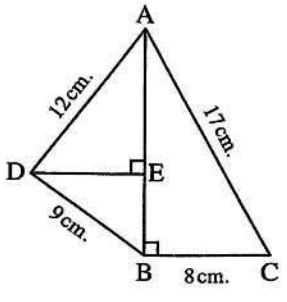
, AD = 12 cm. , AC = 17 cm.

, BC = 8 cm. , DB = 9 cm.

1 **Prove that :** m ($\angle$ ADB) = 90°

2 **Find :** the length of $\overline{DE}$

3 **Find :** the length of the projection of $\overline{AD}$ on $\overleftrightarrow{AB}$



15 Qena Governorate

Qena Directorate
Governmental Language Schools Department

Answer the following questions :

1 Choose the correct answer :

1 If ABC is a right-angled triangle at A and $\overline{AD} \perp \overline{BC}$, then $(AC)^2$ = ...

(a) AB × BC (b) BD × DC (c) BD × BC (d) CD × BC

2 If $\Delta ABC \sim \Delta XYZ$ and AB : XY = 2 : 3 , the perimeter of ΔABC = 14 cm. , then the perimeter of ΔXYZ = ... cm.

(a) 14 (b) 21 (c) 7 (d) 30

3 If the area of a square is 50 cm^2 , then its diagonal length = ... cm.

(a) 10 (b) 5 (c) 15 (d) 25

4 The length of the projection of a line segment ..... the length of the line segment.

(a) > (b) = (c) ≤ (d) ≥

5 If ABCD is a parallelogram in which AB = 7 cm. , BC = 8 cm. and its smaller height is 5 cm. , then its area = ... cm^2

(a) 28 (b) 40 (c) 35 (d) 56

6 The number of axes of symmetry of the isosceles triangle is .....

(a) 0 (b) 1 (c) 2 (d) 4

2 Complete each of the following :

1 If two triangles drawn on a common base and their vertices on a straight line parallel to this base , then they are .....

2 If two polygons are similar to a third polygon , then they are .....

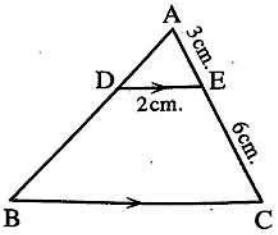
3 If area of a trapezium is 24 cm^2 and its height is 4 cm. , then the length of the middle base is ..... cm.

4 In the triangle ABC , if $(AC)^2 - (BC)^2 > (AB)^2$, then ∠ B is ..... angle.

5 Two triangles are similar if their corresponding side lengths are .....

3 **[a]** A rhombus with diagonal lengths are 12 cm. and 10 cm. and its height 8 cm. find its perimeter.

[b] In the opposite figure :



ABC is a triangle in which $D \in \overline{AB}$, $E \in \overline{AC}$, where $\overline{DE} \parallel \overline{BC}$, AE = 3 cm. , EC = 6 cm. , DE = 2 cm.

1 **Prove that :** $\Delta ADE \sim \Delta ABC$

2 **Find :** The length of $\overline{BC}$

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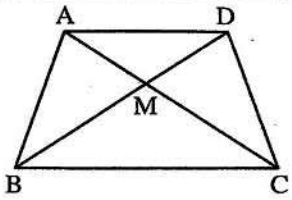
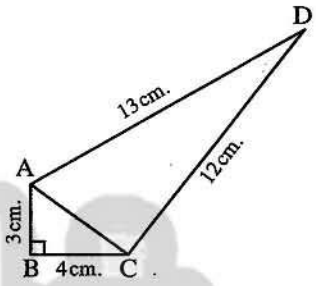
4 **[a] In the opposite figure :**



If the area of ΔAMB = the area of ΔCMD

Prove that : $\overline{AD} \parallel \overline{BC}$

[b] In the opposite figure :



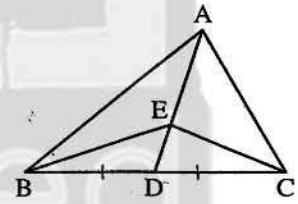
ABCD is a quadrilateral in which m ($\angle$ B) = 90° , AB = 3 cm. , BC = 4 cm. , CD = 12 cm. , AD = 13 cm.

1 **Prove that :** m ($\angle$ ACD) = 90°

2 **Find :** the area of the figure ABCD

---

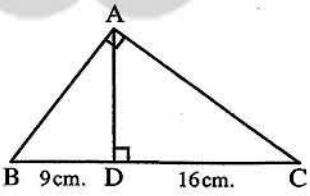
5 **[a] In the opposite figure :**



ABC is a triangle in which : D is the midpoint of $\overline{BC}$, $E \in \overline{AD}$

Prove that : the area of ΔABE = the area of ΔACE

[b] In the opposite figure :



ABC is a right-angled triangle at A , $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm.

Find : 1 The perimeter of the triangle ABC

2 The area of the triangle ABC

Some Schools Examinations on Geometry

1 Cairo Governorate

El-Nozha Educational Zone
Math's Inspection

Answer the following questions :

1 Complete each of the following :

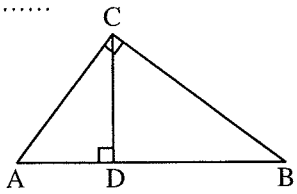
① In Δ ABC , if $(AB)^2 + (BC)^2 < (AC)^2$, then ∠ B is .....

② The two triangles are similar if the corresponding angles are .....

③ **From the opposite figure :**

(a) The projection of $\overline{CD}$ on $\overleftrightarrow{AB}$ is .....

(b) The projection of $\overline{BC}$ on $\overleftrightarrow{AB}$ is .....



④ A rhombus whose diagonal lengths are 6 cm. , 10 cm. has area ..... cm^2.

---

2 Choose the correct answer :

① A square of diagonal length 12 cm. , then its area = ... cm^2.

(a) 24 (b) 36 (c) 48 (d) 72

② In Δ ABC if $(AC)^2 = (AB)^2 + (BC)^2$, then ∠ ..... is right.

(a) A (b) B (c) C (d) otherwise

③ ABC is a triangle where AB = 2 cm. , BC = 6 cm. and CA = 5 cm.
, then m (∠ A) ..... 90°

(a) < (b) > (c) = (d) ≥

④ If Δ ABC ~ Δ XYZ , m (∠ B) = 50° , then m (∠ Y) = ...

(a) 30° (b) 40° (c) 50° (d) 60°

⑤ If the ratio between the length of two corresponding sides in two similar triangles is equal to 1 , then the two triangles are .....

(a) congruent. (b) different. (c) parallel. (d) otherwise.

⑥ * If the lengths of two adjacent sides of a parallelogram are 8 cm. and 10 cm. and its greater height is 5 cm. , then its area = ... cm^2.

(a) 80 (b) 50 (c) 40 (d) 18

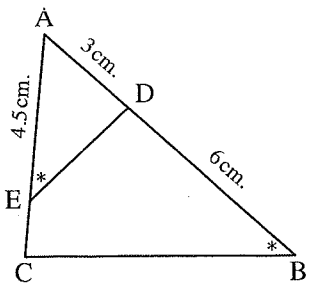
---

3 [a] In the opposite figure :

m (∠ AED) = m (∠ B) , AD = 3 cm.
, AE = 4.5 cm. and BD = 6 cm.

① **Prove that :** Δ ADE ~ Δ ACB

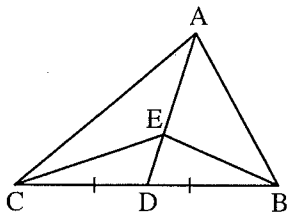
② **Find :** The length of $\overline{EC}$



[b] * In the opposite figure :

ABC is a triangle with a median $\overline{AD}$, $E \in \overline{AD}$, draw $\overline{BE}$ and $\overline{CE}$

Prove that : The area of ΔABE = the area of ΔACE



4 [a] In the opposite figure :

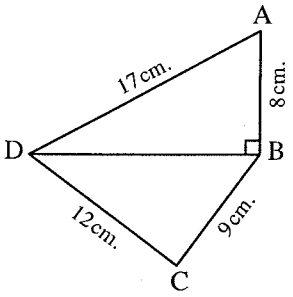
ABCD is a quadrilateral in which

AB = 8 cm. , BC = 9 cm. and CD = 12 cm.

, AD = 17 cm. and $\overline{DB} \perp \overline{AB}$

① **Find :** The length of $\overline{BD}$

② **Prove that :** m ($\angle$ C) = 90°



[b] If the lengths of the two parallel bases of a trapezium are 5 cm. , 7 cm. and if the length of its height 4 cm. , find its area

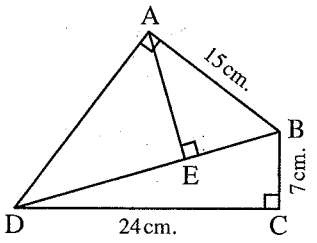
5 In the opposite figure :

ABCD is a quadrilateral , where m ($\angle$ BCD) = m ($\angle$ BAD) = 90°

, $\overline{AE} \perp \overline{BD}$, BC = 7 cm. , CD = 24 cm. and AB = 15 cm.

Find : ① The length of $\overline{BD}$ and $\overline{AD}$

② The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BD}$



2 Cairo Governorate

Abdine Educational Directorate
Sahara Language Schools

Answer the following questions :

1 Choose the correct answer :

① The length of the two adjacent sides in a parallelogram are 7 cm. , 5 cm. and the length of its smallest height is 4 cm.

, then the area of the parallelogram equals ..... cm^2

(a) 35 (b) 25 (c) 28 (d) 49

② If the ratio of enlargement between two similar triangles equals .....

, then the two triangles are congruent.

(a) 1 (b) 2 (c) 0.5 (d) 0.25

③ If ΔABC in which $(AB)^2 + (BC)^2 < (AC)^2$, then ($\angle$ B) is .....

(a) acute. (b) right. (c) reflex. (d) obtuse.

④ If the projection of a line segment on a straight line is a point , then the line segment ..... the straight line.

(a) // (b) ⊥ (c) ≡ (d) ⊂

⑤ If Δ ABC ~ Δ DEO , AB = $\frac{1}{3}$ DE , then the perimeter of Δ ABC equals ..... the perimeter of Δ DEO

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) 3 (d) 9

⑥ * The ratio between the area of the parallelogram and the area of the triangle whose base is common and are included between two parallel straight lines = ...

(a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

---

2 Complete the following questions :

① If Δ ABC ~ Δ XYZ , m (∠ A) + m (∠ B) = 60° , then m (∠ Z) = ...

② The area of the trapezium whose parallel bases 6 cm. , 10 cm. and height 5 cm. equals .....

③ The two polygons are similar to a third are .....

④ The area of rhombus whose perimeter is 20 cm. and height 4 cm. = ...

⑤ The projection of a point which belong to a straight line on this line is .....

---

3 [a] The ratio between the length of corresponding sides of two similar triangle is 3 : 5 and if the perimeter of the greater is 60 cm. , find the perimeter of the smaller triangles.

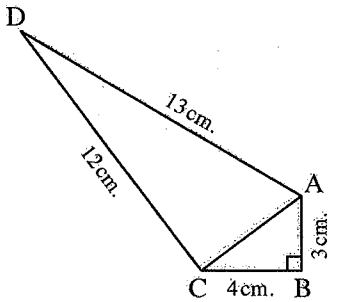
[b] In the opposite figure :

AB = 3 cm. , BC = 4 cm. , AD = 13 cm.

, CD = 12 cm. , m (∠ B) = 90°

① **Find :** The length of : $\overline{AC}$

② **Prove that :** m (∠ ACD) = 90°



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4 [a] Δ ABC where AB = 6 cm. , BC = 8 cm. , AC = 4 cm. , determine the type of the angle BAC

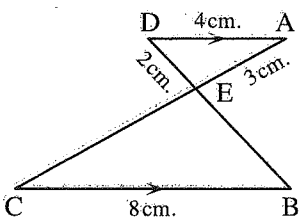
[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, AD = 4 cm. , AE = 3 cm.

, DE = 2 cm. , BC = 8 cm.

① **Prove that :** Δ AED ~ Δ CED

② **Find :** The perimeter of Δ EBC

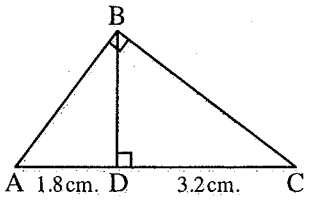


5 **[a] In the opposite figure :**

m (∠ ABC) = 90° , $\overline{BD} \perp \overline{AC}$

, AD = 1.8 cm. , DC = 3.2 cm.

Find : The length of each : $\overline{BD}$, $\overline{AB}$



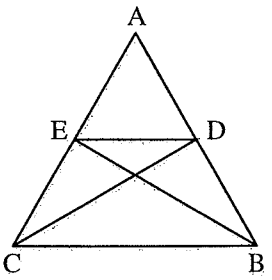
[b] ✻ In the opposite figure :

ABC is a triangle in which

$D \in \overline{AB}$ and $E \in \overline{AC}$

such that the area of Δ ABE = the area of Δ ACD

Prove that : $\overline{DE} // \overline{BC}$



3 Cairo Governorate

Rod El-Farag Educational Zone
St. Mary's School

Answer the following questions :

1 **Choose the correct answer between brackets :**

(1) The length of the base of a triangle whose area 36 cm^2 and height 8 cm. is ..... cm.

(a) 6 (b) 9 (c) 18 (d) 20

(2) If $\overline{AB} // \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... length of $\overline{AB}$

(a) < (b) > (c) = (d) ≥

(3) The area of the trapezium whose middle bases 7 cm. , and height 6 cm. = ... cm^2

(a) 21 (b) 42 (c) 40 (d) 13

(4) If the area of a parallelogram is 80 cm^2 and one of its bases length 10 cm. , then the length of the corresponding height of this base = ... cm.

(a) 8 (b) 6 (c) 7 (d) 20

(5) Δ ABC in which AB = 4 cm. , BC = 6 cm. , AC = 8 cm. , then m (∠ B) ..... 90°

(a) > (b) < (c) = (d) twice

(6) ✻ The length of the base of a triangle whose area 30 cm^2 and height 6 cm. is ..... cm.

(a) 5 (b) 10 (c) 15 (d) 20

2 **Complete each of the following :**

(1) The two polygons are similar if the corresponding sides ..... and their corresponding angles .....

(2) The area of the rhombus whose diagonals 6 cm. , 8 cm. equals ..... cm^2

(3) The diagonal of a square whose area 50 cm^2 equals ..... cm.

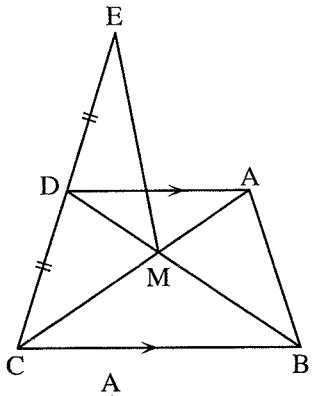
④ If two polygons are similar and the ratio between the lengths of two corresponding side is 1 : 3 and the perimeter of smaller polygons is 12 cm. , then the perimeter of the greater polygon is .....

3 **[a] * In the opposite figure :**

$\overline{AD}$ // $\overline{BC}$ and $\overline{AC} \cap \overline{BD} = \{M\}$

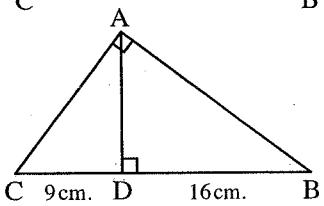
, D is the midpoint of $\overline{EC}$

Prove that : The area of Δ MDE = the area of Δ AMB



[b] In the opposite figure :

Find : The length of $\overline{AB}$, $\overline{AC}$, and $\overline{AD}$



4 **[a] In the opposite figure :**

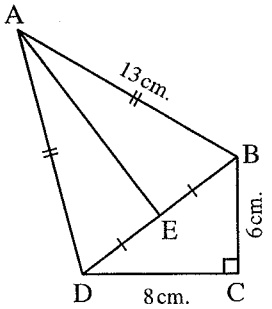
ABCD is a quadrilateral

in which m (∠ C) = 90°

AB = AD = 13 cm. , BC = 6 cm.

, CD = 8 cm. , E is midpoint of $\overline{BD}$

Find : The area of the shape ABCD



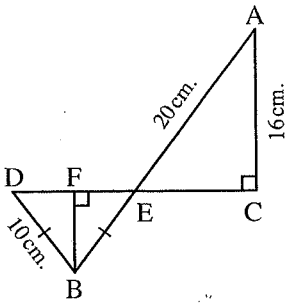
[b] In the opposite figure :

$\overline{AB} \cap \overline{CD} = \{E\}$, E is the midpoint of $\overline{CD}$

, AC = 16 cm. , AE = 20 cm.

, BD = BE = 10 cm.

Find : The length of the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$



5 **[a]** The length of the middle base of a trapezium is 30 cm. and the ratio between the length of its two parallel bases is 2 : 3

Find the length of each of them and if its height = 24 cm. , find its area.

[b] In the opposite figure :

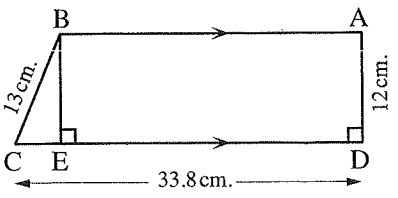
ABCD is a trapezium in which $\overline{AB}$ // $\overline{DC}$, $\overline{AD} \perp \overline{DC}$

, AD = 12 cm. , BC = 13 cm. , DC = 33.8 cm. , $\overline{BE} \perp \overline{DC}$

① **Find :** The length of $\overline{CE}$, $\overline{AB}$, $\overline{DB}$

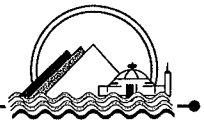
② **Find :** The length of the projection of $\overline{DC}$ on $\overleftrightarrow{AB}$

③ **Prove that :** m (∠ DBC) = 90°



4 Giza Governorate

El-Haram Directorate
Al-Omran Language School



Answer the following questions :

1 Choose the correct answer :

① In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

② If $\overline{AB} \parallel \overline{XY}$, then the length of the projection of $\overline{AB}$ on $\overline{XY}$ ..... the length of $\overline{AB}$

(a) > (b) ≤ (c) = (d) <

③ A rhombus whose diagonal lengths 12 cm. , 9 cm. , then its area = ... cm^2

(a) 18 (b) 54 (c) 45 (d) 108

④ Area of the trapezium whose base lengths are 6 cm. , 8 cm. and its height 10 cm. = ... cm^2

(a) 140 (b) 480 (c) 70 (d) 120

⑤ ABC is a triangle in which $(AB)^2 = (BC)^2 + (AC)^2$ and m (∠ B) = 40° , then m (∠ A) = ...

(a) 40° (b) 50° (c) 90° (d) 130°

⑥ ✻ The median of a triangle divides its surface into two .....

(a) congruent triangles. (b) triangles equal in area.

(c) isosceles triangle. (d) right-angled triangle.

---

2 Complete each of the following :

① The ratio between the length of two corresponding sides of two similar polygon is 3 : 5 , then the ratio between their perimeter = ...

② If $\overline{AD} \perp \overline{BC}$, then the projection of $\overline{AD}$ on $\overleftrightarrow{BC}$ is .....

③ A square of diagonal length 12 cm. , then its area = ... cm^2

④ A triangle whose side lengths 6 cm. , 8 cm. , 11 cm. , then its type according to its angle is .....

⑤ If Δ ABC ~ Δ DEF and m (∠ B) + m (∠ C) = 70° , then m (∠ D) = ...°

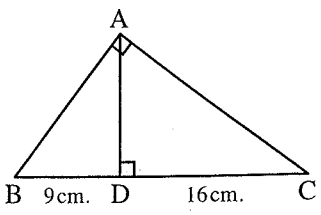
---

3 [a] In the opposite figure :

In Δ ABC , BD = 9 cm.

, DC = 16 cm.

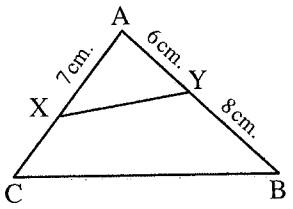
Find : Lengths of each of : $\overline{AD}$, $\overline{AB}$, $\overline{AC}$



[b] ABCD is trapezium in which $\overline{AD}$ // $\overline{BC}$, if BC = 2 AD = 20 cm. and its area = 180 cm^2 , find the length of its height.

4 **[a] In the opposite figure :**

If Δ AXY ~ Δ ABC , AX = 7 cm. , AY = 6 cm. , YB = 8 cm.



(1) **Find :** The length of $\overline{XC}$

(2) **Find :** $\frac{XY}{BC}$

[b] Δ EFD ~ Δ ABC , AB = 4 cm. , BC = 5 cm. , AC = 6 cm.

, if the perimeter of Δ EFD = 60 cm. , find the length of sides Δ EFD

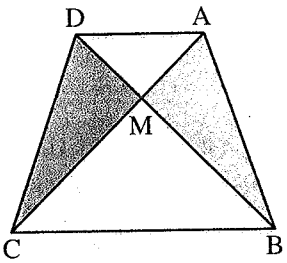
5 **[a] ✻ In the opposite figure :**

ABCD is a quadrilateral

, its diagonals intersect at M

and the area of Δ ABM = the area of Δ DCM

Prove that : $\overline{AD}$ // $\overline{BC}$



[b] In the opposite figure :

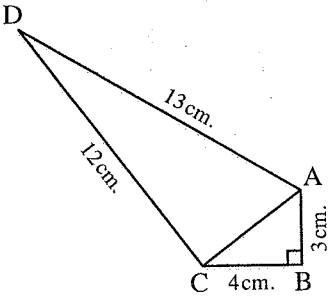
AB = 3 cm. , BC = 4 cm.

, AD = 13 cm.

, CD = 12 cm.

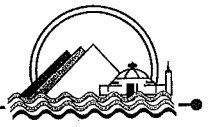
and m (∠ ABC) = 90°

Prove that : m (∠ ACD) = 90°



5 Giza Governorate

6th October Directorate
Om El-Mo'mneen Language School



Answer the following questions :

1 **Complete each of the following :**

(1) The ratio between the lengths of corresponding sides of two similar triangle is 3 : 5 if the perimeter of the greater triangle is 60 cm. , then the perimeter of the smaller triangle is .....

(2) The triangle whose side lengths are 5 cm. , 8 cm. , 7 cm. is ..... angled triangle.

(3) If the length of middle base of a trapezium is 15 cm. and its area equal 75 cm^2 , then the length of its height = ... cm.

(4) In ΔABC , if $(AB)^2 = (AC)^2 - (BC)^2$, then m (∠ B) = ... °

(5) The projection of a straight line on a straight line ..... is a point of intersection of two straight lines.

2 Choose the correct answer :

(1) The area of the triangle whose side length are 3 cm. , 4 cm. , 5 cm. is ..... cm^2

(a) 6 (b) 8 (c) 12 (d) 60

(2) If Δ ABC is an obtuse-angled triangle at A , AB = 5 cm. , BC = 8 cm. , then AC = ... cm.

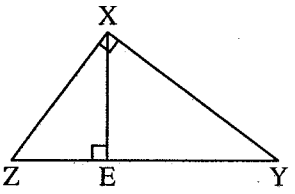
(a) 5 (b) 7 (c) 8 (d) 9

(3) If the ratio of enlargement between two triangle equals ..... , then the two triangles are congruent.

(a) 0.5 (b) 1 (c) 2 (d) 4

(4) **In the opposite figure :**

EY × EZ = ...



(a) $(XY)^2$ (b) $(XZ)^2$

(c) $(XE)^2$ (d) $(YZ)^2$

(5) The length of the projection of a line segment on a straight line parallel to it ..... the length of the main line segment.

(a) $\geq$ (b) $\leq$ (c) > (d) =

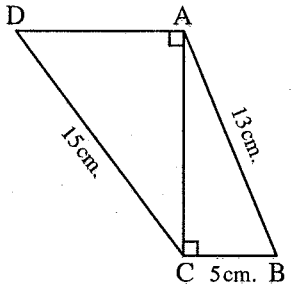
(6) * The area of the triangle is ..... the area of the parallelogram which has a common base with it and its vertex lies on the straight line parallel to this base.

(a) equal to (b) half (c) twice (d) quarter

---

3 [a] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, AB = 13 cm. , BC = 5 cm. , CD = 15 cm. , m ($\angle$ ACB) = m ($\angle$ DAC) = 90°

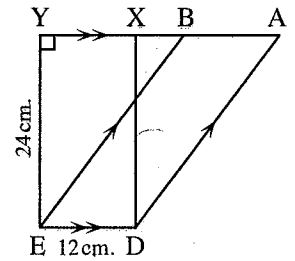


Find : (1) The length of the projection of $\overline{AB}$ on $\overleftrightarrow{AC}$

(2) The length of the projection of $\overline{CD}$ on $\overleftrightarrow{AD}$

[b] * In the opposite figure :

$\overleftrightarrow{AB}$ // $\overleftrightarrow{DE}$, X and Y $\in \overleftrightarrow{AB}$, XDEY is a rectangle and $\overline{AD}$ // $\overline{BE}$



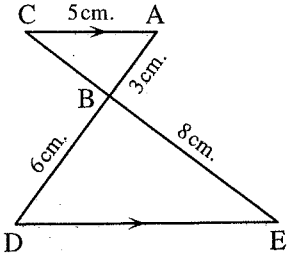
(1) **Find :** The area of the figure ABED

(2) If AD = 30 cm. , find the length of the perpendicular from B to $\overline{AD}$

---

4 [a] In the opposite figure :

$\overline{AC}$ // $\overline{ED}$, AB = 3 cm. , BD = 6 cm. , AC = 5 cm. , BE = 8 cm.



Prove that : Δ ABC ~ Δ DBE , then find the length of : $\overline{ED}$, $\overline{BC}$

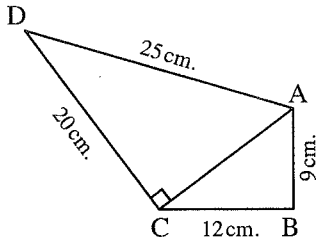
[b] In the opposite figure :

m (∠ ACD) = 90° , AB = 9 cm.

, BC = 12 cm. , AD = 25 cm.

, DC = 20 cm.

Prove that : m (∠ ABC) = 90°



5 In the opposite figure :

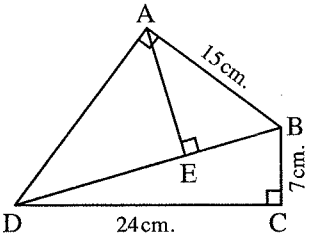
ABCD is a quadrilateral where : m (∠ BCD) = m (∠ BAD) = 90°

$\overline{AE} \perp \overline{BD}$, BC = 7 cm. , CD = 24 cm. and AB = 15 cm.

Find : ① The length of each of $\overline{BD}$ and $\overline{AD}$

② The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BD}$

③ The length of the projection of $\overline{AD}$ on $\overleftrightarrow{AE}$



6 Alexandria Governorate

El-Montaza Educational Zone
victory college for boys

Answer the following questions :

1 Complete each of the following :

① Δ ABC is a right-angled triangle at B , AB = 6 cm. , BC = 8 cm.
, then AC = ... cm.

② If $\overline{AD} \perp \overleftrightarrow{BC}$, then the projection of $\overline{AD}$ on $\overleftrightarrow{CB}$ is .....

③ In Δ ABC : If $(AC)^2 + (BC)^2 = (AB)^2$, then m (∠ .....) = 90°

④ The two triangles are similar if their corresponding angles are ..... in measure.

⑤ The rectangle is parallelogram in which one of its angles is .....

2 Choose the correct answer :

① The two angles of measures 130° and 50° are .....

(a) complementary. (b) supplementary. (c) adjacent. (d) reflex.

② In Δ ABC : if $(AB)^2 > (BC)^2 + (AC)^2$, then angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

③ If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$.

(a) = (b) < (c) > (d) ≤

④ Δ ABC in which $(AB)^2 = (AC)^2 + (BC)^2$, m (∠ B) = 40° , then m (∠ A) = ...

(a) 130° (b) 50° (c) 90° (d) 40°

⑤ If the ratio of enlargement between two similar triangles equals 1
, then the two triangles are .....

(a) congruent. (b) different. (c) right-angle. (d) coincide.

⑥ * The area of a right-angled triangle in which the lengths of the sides of the right angle are 6 cm. and 9 cm. equals .....

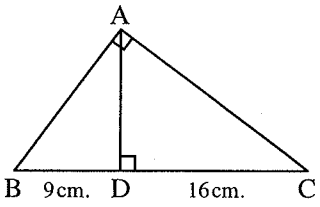
(a) 54 cm^2 (b) 60 cm^2 (c) 27 cm^2 (d) 15 cm^2

3 **[a]** Determine the type of angle C in Δ ABC in which AB = 7 cm. , BC = 3 cm. , and AC = 5 cm.

[b] In the opposite figure :

Δ ABC is right-angled triangle at A , in which $\overline{AD} \perp \overline{BC}$, BD = 9 cm. and CD = 16 cm.

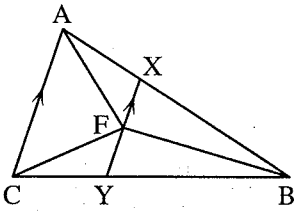
Find : The length of each of : $\overline{AB}$, $\overline{AC}$ and $\overline{AD}$



4 **[a]** * **In the opposite figure :**

$\overline{AC}$ // $\overline{XY}$ and F is the midpoint of $\overline{XY}$

Prove that : The area of Δ ABF = the area of Δ CBF



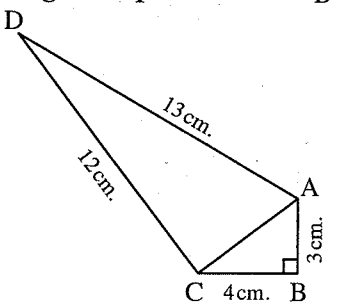
[b] In the opposite figure :

AB = 3 cm. , BC = 4 cm.

, AD = 13 cm. , CD = 12 cm.

, m (∠ B) = 90°

Prove that : m (∠ ACD) = 90°



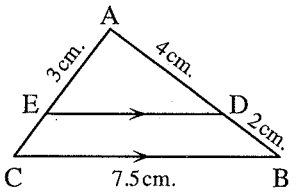
5 **In the opposite figure :**

$\overline{DE}$ // $\overline{BC}$, AD = 4 cm. , AE = 3 cm. , BD = 2 cm. and BC = 7.5 cm.

① **Prove that :** Δ ADE ~ Δ ABC

② **Find :** The length of $\overline{ED}$

③ **Find :** The perimeter of Δ ADE



7 Alexandria Governorate

East Educational Zone
Mathematics Directing

Answer the following questions : ***(Allows the use of a calculator)***

1 **Complete each of the following :**

① The square is a rectangle in which .....

② If the triangle ABC is right-angled at ∠ B and the projection of $\overline{AB}$ on $\overleftrightarrow{AC}$ is $\overline{DA}$, then $(AB)^2$ = ... × .....

③ If $\overline{AB} \perp \overline{BC}$, then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

④ In Δ ABC if : $(AB)^2 > (BC)^2 + (AC)^2$, then m (∠ .....) > 90°

⑤ The triangles are similar if the corresponding angles are .....

2 Choose the correct answer from those given :

(1) The sum of the measure of the interior angles of a triangle = ...

(a) 90° (b) 180° (c) 270° (d) 360°

(2) $(AB)^2 - (BC)^2 = (AC)^2$, then .....

(a) m (∠ A) > 90° (b) m (∠ B) = 90° (c) m (∠ A) = 90° (d) m (∠ C) = 90°

(3) If Δ ABC ~ Δ DEF and AB = $\frac{1}{2}$ DE , then the perimeter of Δ ABC = ... the perimeter of Δ DEF

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) 2 (d) 4

(4) In Δ ABC if m (∠ C) = 90° , AB = 20 cm. and BC = 16 cm. , then AC = ... cm.

(a) 9 (b) 12 (c) $4\sqrt{41}$ (d) 25

(5) If $\overline{AB}$ // $\overline{CD}$ and the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$ is $\overline{XY}$, then XY ..... AB

(a) > (b) < (c) = (d) //

(6) * If the base length of a parallelogram is 7 cm. and the corresponding height is 4 cm. , then its area ..... cm^2

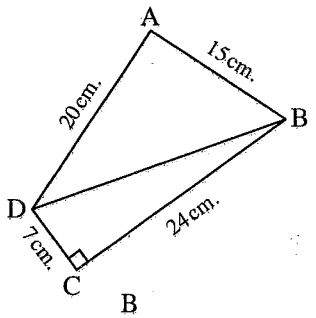
(a) 11 (b) 14 (c) 22 (d) 28

---

3 [a] In the opposite figure :

AB = 15 cm. , BC = 24 cm. , CD = 7 cm. , DA = 20 cm. and m (∠ C) = 90°

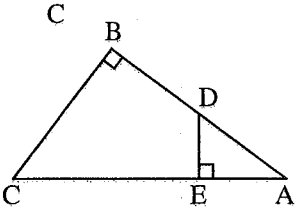
Prove that : m (∠ A) = 90°



[b] In the opposite figure :

m (∠ B) = 90° , $\overline{DE} \perp \overline{AC}$

Prove that : Δ ABC ~ Δ AED



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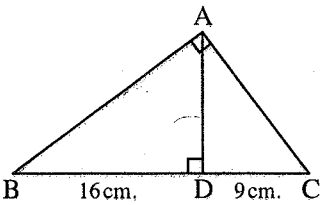
4 In the opposite figure :

m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

[a] Find the projection of :

(1) $\overline{AB}$ on $\overleftrightarrow{AC}$ (2) $\overline{AC}$ on $\overleftrightarrow{BC}$ (3) $\overline{BC}$ on $\overleftrightarrow{AB}$



[b] If BD = 16 cm. and DC = 9 cm. **Find :** The length of $\overline{AD}$, $\overline{AC}$, $\overline{AB}$

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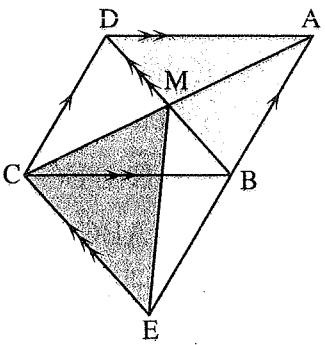
5 [a] * In the opposite figure :

ABCD and BECD are two parallelograms , where $\overline{AC} \cap \overline{BD} = \{M\}$

Prove that : The area of Δ ABD = the area of Δ MEC

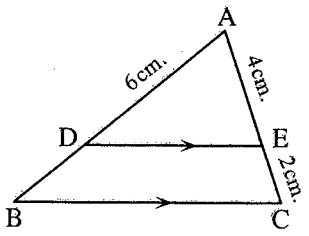


[b] In the opposite figure :

$\overline{DE}$ // $\overline{BC}$, AE = 4 cm.

, EC = 2 cm. , AD = 6 cm.

Find : With proof the length of $\overline{AB}$



8 El-Kalyoubia Governorate

Educational Zone
Language School

Answer the following questions :

1 Choose the correct answer from those given :

① Δ ABC in which AB = 3 cm. , BC = 6 cm. , and AC = 4 cm.
, then m (∠ B) ..... 90°

(a) < (b) > (c) = (d) ≤

② If $\overline{AC}$ is the projection of $\overline{AB}$ on $\overleftrightarrow{AC}$, then AC ..... AB

(a) < (b) > (c) = (d) ≤

③ If Δ ABC ~ Δ DEF and AB = $\frac{2}{5}$ DE
, then the perimeter of Δ ABC = ... the perimeter of Δ DEF

(a) 2 (b) 5 (c) $\frac{2}{5}$ (d) $\frac{4}{25}$

④ ABC is a right-angled triangle at B , AC = 10 cm. , BC = 8 cm. , then AB = ... cm.

(a) 8 (b) 10 (c) 6 (d) 4

⑤ ABC is a triangle in which $(AB)^2 = (AC)^2 + (BC)^2$, m (∠ B) = 40°
, then m (∠ A) = ...

(a) 90° (b) 40° (c) 130° (d) 50°

⑥ ✱ The triangle whose base length is 6 cm. and its area is 24 cm^2 , the corresponding height = ... cm.

(a) 4 (b) 8 (c) 3 (d) 18

2 Complete each of the following :

① The two diagonals of the isosceles trapezium are .....

② The two triangles are similar if its corresponding side lengths are .....

③ The number of the diagonals of the quadrilateral = ...

④ The area of the trapezium = ... × .....

⑤ The area of the square = $\frac{1}{2}$ .....

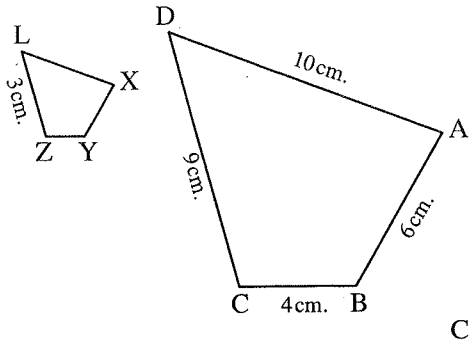
3 **[a] In the opposite figure :**

The polygon ABCD ~ the polygon XYZL

, AB = 6 cm. , BC = 4 cm. , CD = 9 cm.

, DA = 10 cm. , ZL = 3 cm.

Find : The perimeter of the polygon XYZL



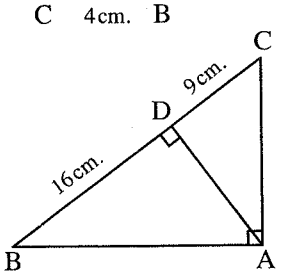
[b] In the opposite figure :

ABC is a right-angled triangle at A

, $\overline{AD} \perp \overline{BC}$, BD = 16 cm.

, DC = 9 cm.

Find : The length of each $\overline{AB}$ and $\overline{AD}$



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4 **[a]** A square whose area equals the area of the rectangle whose dimensions are 2 cm. and 9 cm. find the length of its diagonal.

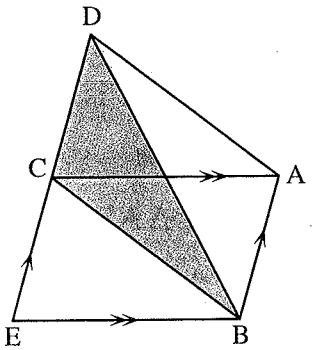
[b] * In the opposite figure :

ABEC is a parallelogram.

, $D \in \overrightarrow{EC}$

such that : The area of Δ DBC = the area of Δ EBC

Prove that : $\overline{AD} // \overline{BC}$



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5 **[a]** A rhombus , the ratio between the length of the two diagonals is 5 : 8 , if it's area = 2000 cm^2 , find the length of each it's diagonals.

[b] Determine the type of Δ ABC according to it's angles if AB = 3.5 cm. , BC = 2.5 cm. and AC = 3 cm.

9 El-Monofia Governorate

Menouf Eductional Directorate

Answer the following questions :

1 **Complete each of the following :**

(1) In Δ ABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then m (∠ .....) = 90°

(2) The area of rhombus is 20 cm^2 , the length of one of its diagonals is 5 cm. , then the length of the other diagonal = ...

(3) If Δ ABC is right-angled at A and $\overline{AD} \perp \overline{BC}$, then $(AB)^2$ = ... × .....

(4) The isosceles trapezium has ..... axes of symmetry.

(5) ABC is a triangle in which : $(BC)^2 = (AB)^2 + (AC)^2$, m (∠ B) = 40° , then m (∠ C) = ...°

2 **Choose the correct answer :**

(1) A square of diagonal length 12 cm. , then its area = ... cm^2

(a) 24 (b) 36 (c) 48 (d) 72

(2) If $\Delta ABC \sim \Delta DEF$ and $m(\angle B) + m(\angle C) = 70°$, then $m(\angle D)$ = ...

(a) 70° (b) 35° (c) 140° (d) 110°

(3) The middle base of a trapezium = 12 cm. long and its height = 6 cm. , then its area = ... cm^2

(a) 72 (b) 36 (c) 9 (d) 18

(4) The length of the projection of a line segment on a given straight line ..... the length of the line segment itself.

(a) < (b) ≤ (c) ≥ (d) =

(5) ABC is an obtuse-angled triangle at A in which AB = 5 cm. , BC = 8 cm. , then AC = ... cm.

(a) 5 (b) 7 (c) 8 (d) 13

(6) * The two triangles drawn on a common base their vertices located on a straight line parallel to the base are .....

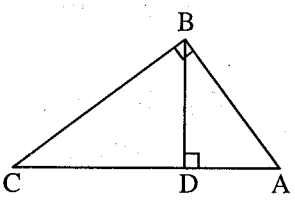
(a) congruent. (b) similar. (c) equal in perimeter. (d) equal in area.

---

3 **[a] In the opposite figure :**

ΔABC is right-angled at B , $\overline{BD} \perp \overline{AC}$, AD = 9 cm. , and CD = 16 cm.

Find : (1) The length of $\overline{AB}$ (2) The length of $\overline{BD}$



[b] Determine the type of ΔABC according to its angles.
If AB = 2.5 cm. , BC = 1.5 cm. and AC = 2 cm.

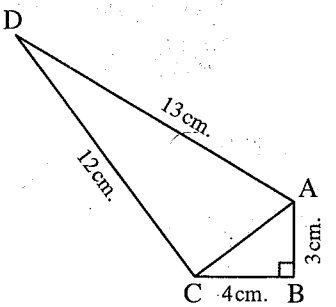
---

4 **[a] In the opposite figure :**

BC = 4 cm. , AD = 13 cm. , AB = 3 cm. , DC = 12 cm. , $m(\angle B) = 90°$

(1) **Find :** The length of $\overline{AC}$

(2) **Prove that :** $m(\angle ACD) = 90°$

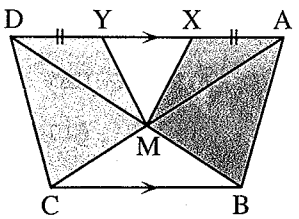


[b] * In the opposite figure :

ABCD is a quadrilateral whose diagonals intersect at M , $\overline{AD} // \overline{BC}$, $X \in \overline{AD}$ and $Y \in \overline{AD}$

Such that : AX = DY

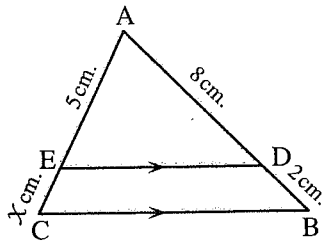
Prove that : The area of the figure ABMX = the area of the figure DCMY



5 **[a]** Two similar polygons in which the ration between the lengths of two corresponding sides is 1 : 3 if the perimeter of the smaller is 20 cm. , find the perimeter of the greater.

[b] In the opposite figure :

ABC is a triangle in which $\overline{DE}$ // $\overline{BC}$, BD = 2 cm. , AD = 8 cm. , AE = 5 cm. , CE = x cm.



(1) **Prove that :** $\Delta ADE \sim \Delta ABC$

(2) **Find the value of :** x

10 El-Gharbia Governorate

Centeral Maths supervision
Official language schools

Answer the following questions :

1 **Complete each of the following :**

(1) In ΔABC , if $(AC)^2 + (BC)^2 = (AB)^2$, then m ($\angle$ .....) = 90°

(2) If the point A $\in$ the line L , then the projection of the point A on the line L is .....

(3) A trapezium whose bases lengths are 8 cm. , 10 cm. , and its height is 5 cm. , then its area equals ..... cm^2.

(4) The area of rhombus is 24 cm^2. , the length of one of its diagonals is 8 cm. , then the length of other diagonal is .....

(5) The two polygons that are similar to third are .....

2 **Choose the correct answer :**

(1) A square of perimeter 20 cm. , then its area equals ..... cm^2.

(a) 20 (b) 25 (c) 50 (d) 100

(2) ABC is right-angled triangle at B , $\overline{BD} \perp \overline{AC}$, D $\in \overline{AC}$, then the projection of $\overline{BD}$ on $\overline{AC}$ is .....

(a) A (b) B (c) C (d) D

(3) If the ratio of enlargement between two triangles equals 1 , then the two triangles are .....

(a) congruent. (b) different. (c) right-angled. (d) coincide.

(4) A trapezium whose middle base length is 8 cm. , then the length of the two parallel bases may be ..... cm.

(a) 3 , 5 (b) 6 , 10 (c) 4 , 6 (d) 4 , 4

(5) In ΔABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

⑥ * ABCD is a parallelogram in which , AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its greater height = ... cm.

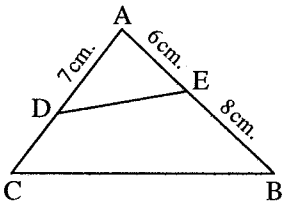
(a) 2 (b) 4 (c) 8 (d) 10

3 **[a] In the opposite figure :**

If Δ ABC ~ Δ ADE , AE = 6 cm.

, AD = 7 cm. and BE = 8 cm.

Find : ① DC ② $\frac{DE}{BC}$

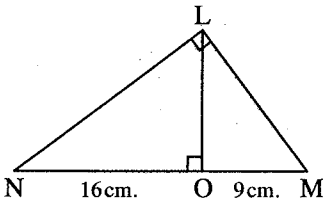


[b] In the opposite figure :

LMN is a right-angled triangle at L

, $\overline{LO} \perp \overline{MN}$, MO = 9 cm. and NO = 16 cm.

Find : The length of each of $\overline{LM}$, $\overline{LN}$ and $\overline{LO}$



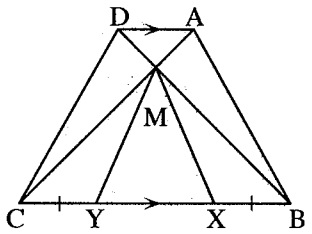
4 **[a]** Determine the type of the angle C in Δ ABC in which AB = 7 cm. , BC = 3 cm. and AC = 5 cm.

[b] * In the opposite figure :

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$ and BX = CY

Prove that :

The area of the figure ABXM = the area of the figure DCYM



5 **Complete : In the opposite figure :**

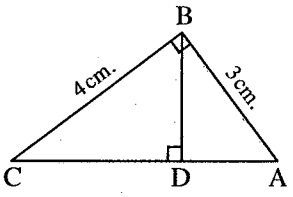
ABC is a right-angled triangle at B , $\overline{BD} \perp \overline{AC}$

① The projection of $\overline{AB}$ on $\overleftrightarrow{AC}$ is .....

② $(BD)^2$ = AD × ..... ③ $(BC)^2$ = CA × .....

④ Δ ABC ~ Δ ..... ~ Δ .....

⑤ The perimeter of Δ ABC : the perimeter of Δ DBC = ...



11 Suez Governorate

Math's Inspectorate

Answer the following questions :

1 **Choose the correct answer :**

① In Δ ABC if $(AC)^2 + (AB)^2 < (BC)^2$, then ∠ A is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

② The area of square of diagonal length 6 cm. is ..... cm^2.

(a) 18 (b) 36 (c) 12 (d) 6

③ If the projection of a line segment on a straight line is a point , then the line segment ..... straight line.

(a) // (b) $\perp$ (c) $\equiv$ (d) $\subset$

④ $\Delta ABC \sim \Delta XYZ$ if $AB = \frac{1}{2}XY$, then perimeter of ΔXYZ = ... perimeter of ΔABC

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) 2 (d) 3

⑤ The number of axes of symmetry of the rectangle is .....

(a) 0 (b) 3 (c) 1 (d) 2

⑥ * If ABCD is a parallelogram with area 20 cm^2 and $E \in \overline{AD}$, then the area of ΔEBC = ... cm^2

(a) 10 (b) 5 (c) 20 (d) 40

---

2 Complete each of the following :

① A triangle of sides length 8 cm. , 9 cm. , 6 cm. its type is ..... angled triangle.

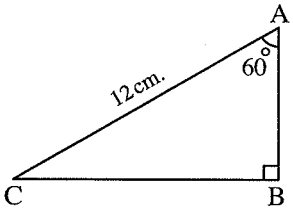
② The area of rhombus whose diagonals are 18 cm. and 15 cm. is ..... cm^2

③ **In the opposite figure :**

$AC = 12$ cm. , $m(\angle B) = 90°$

, $m(\angle A) = 60°$

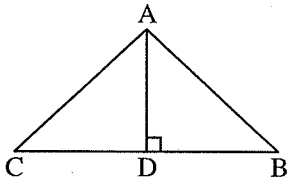
, AB = ... cm.



④ Two triangles are similar if their corresponding angles are .....

⑤ **In the opposite figure :**

The projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....



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3 [a] Find the area of trapezium of length of two parallel base 9 cm. , 6 cm. and its height is 8 cm.

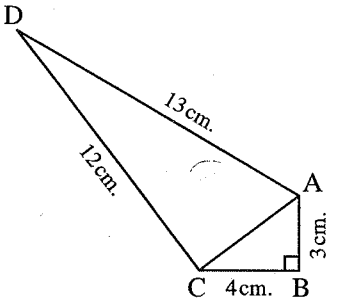
[b] In the opposite figure :

$AB = 3$ cm. , $AD = 13$ cm. , $BC = 4$ cm.

, $DC = 12$ cm. , $m(\angle B) = 90°$

① **Find :** The length of $\overline{AC}$

② **Prove that :** $m(\angle ACD) = 90°$



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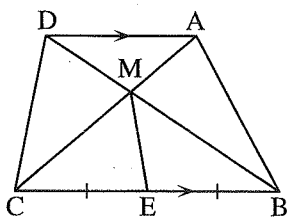
4 [a] * **In the opposite figure :**

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, E is the midpoint of $\overline{BC}$

Prove that :

The area of the figure ABEM = the area of the figure DMEC

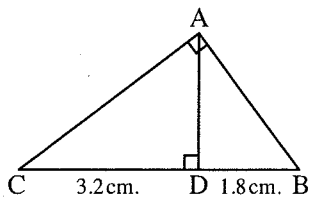


[b] In the opposite figure :

DB = 1.8 cm.

, CD = 3.2 cm.

Find : The length of each of : $\overline{AB}$, $\overline{AD}$ and $\overline{AC}$



5 **[a]** A trapezium with area 40 cm^2 and its height is 5 cm. its middle base = ... cm.

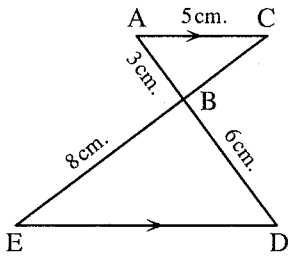
[b] In the opposite figure :

$\overline{AC}$ // $\overline{ED}$, AC = 5 cm. , AB = 3 cm.

, DB = 6 cm. , EB = 8 cm.

Prove that : $\Delta ABC \sim \Delta DBE$

Find : The length of each of : $\overline{BC}$, $\overline{DE}$



12 Port Said Governorate

Governmental Exp. Lang. School

Answer the following questions :

1 **Complete each of the following :**

(1) The two triangles are similar if there corresponding angles are ..... in measure.

(2) A trapezium whose base lengths are 4 cm. and 6 cm.
, then the length of its middle base = ... cm.

(3) The projection of a point on a given straight line is .....

(4) In ΔABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then m ($\angle$ .....) = 90°

(5) The isosceles trapezium has ..... axis of symmetry.

2 **Choose the correct answer from the given ones :**

(1) The area of rhombus whose diagonal lengths are 6 cm. , 8 cm. = ... cm^2

(a) 2 (b) 14 (c) 24 (d) 48

(2) The length of projection of a given line segment ..... the length of the original line segment.

(a) ≥ (b) > (c) ≤ (d) <

(3) In ΔABC if $(AB)^2 < (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) obtuse. (c) right. (d) straight.

(4) If the ratio between the lengths of two corresponding sides in two similar triangles is equal to 1 , then the two triangles are .....

(a) congruent. (b) different. (c) right-angle. (d) coincide.

(5) The area of the square whose side length 4 cm. = ... cm^2

(a) 4 (b) 16 (c) 8 (d) 1

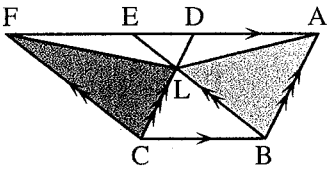
(6) * If $\overline{XL}$ is a median in ΔXYZ

, then the area of ΔXYZ = ... the area of ΔXYL

(a) $\frac{1}{2}$ (b) 3 (c) 2 (d) 3

3 **[a]** Find the area of trapezium whose length of two parallel bases 3 cm. , 5 cm. and its height 10 cm.

[b] * In the opposite figure :



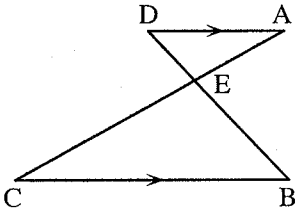
ABCD and EBCF are two parallelograms

, $\overline{BE} \cap \overline{CD} = \{L\}$, $D \in \overline{AF}$ and $E \in \overline{AF}$

Prove that : (1) The area of ΔABL = the area of ΔFCL

(2) The area of the figure ABCL = the area of the figure FCBL

4 **[a] In the opposite figure :**



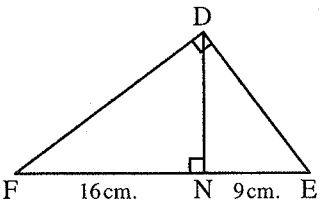
$\overline{AD} // \overline{BC}$

Prove that : $\Delta AED \sim \Delta CEB$

[b] In ΔXYZ , XY = 9 cm. , YZ = 12 cm. and XZ = 15 cm.

Prove that : m ($\angle XYZ$) = 90°

5 **[a] In the opposite figure :**



DEF is a right-angled triangle at D

, $\overline{DN} \perp \overline{EF}$, EN = 9 cm. and NF = 16 cm.

Find : The length of $\overline{EF}$, $\overline{DE}$ and $\overline{DF}$

[b] Determine the type of ΔABC according to its angles

If AB = 7 cm. , BC = 12 cm. and AC = 8 cm.

13 Kafr El-Sheikh Governorate

Inspection of Mathematic Language Schools

Answer the following questions :

1 **Choose the correct answer :**

(1) A trapezium whose middle base length is 12 cm. and its height = 3 dm.

, then its area = ... cm^2

(a) 360 (b) 15 (c) 63 (d) 36

② Rhombus , the lengths of its diagonals are 6 cm. and 8 cm. , then its perimeter = ... cm.

(a) 24 (b) 28 (c) 20 (d) 14

③ Number of axis of symmetry of isosceles trapezium = ...

(a) 1 (b) 2 (c) 3 (d) 4

④ In Δ ABC if $(AB)^2 = (AC)^2 - (BC)^2$, then (∠ C) is ..... angle.

(a) right (b) acute (c) obtuse (d) straight

⑤ ABC is an acute angled-triangle which AB = 6 cm. , BC = 8 cm. , the length of $\overline{AC}$ = ... cm.

(a) 2 (b) 6 (c) 10 (d) 14

⑥ * If ABCD is a parallelogram in which AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its greater height = ...

(a) 2 cm. (b) 4 cm. (c) 8 cm. (d) 10 cm.

2 Complete each of the following :

① If two polygons are similar to a third , then they are .....

② The length of the projection of a line segment on a straight line perpendicular to it = ...

③ The length of the projection of a line segment on a straight line ..... the length of the original line segment.

④ In Δ XYZ , if $(XY)^2 = (ZY)^2 + (XZ)^2 + 5$, then m (∠ XZY) > .....°

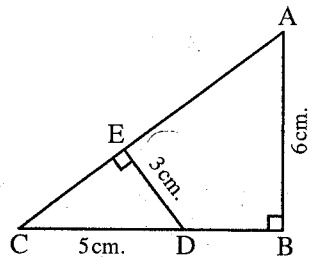
⑤ The diagonals of an isosceles trapezium are ..... .

3 [a] The area of a trapezium is 450 cm^2 and the two bases lengths are 12 cm. and 24 cm. find the length of its height.

[b] In the opposite figure :

ABC is a right-angled triangle at B , $\overline{ED} \perp \overline{AC}$, AB = 6 cm. , ED = 3 cm. , CD = 5 cm.

Prove that : Δ CED ~ Δ CBA , then find the length of $\overline{AC}$

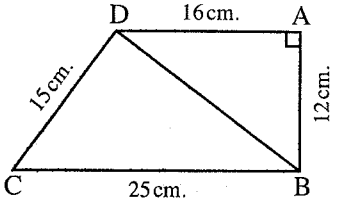


4 [a] In the opposite figure :

$\overline{AD} \perp \overline{AB}$, AB = 12 cm. , AD = 16 cm. , CD = 15 cm. , CB = 25 cm.

Prove that : ① Δ CBD is right-angled.

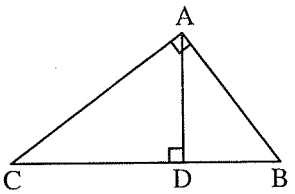
② Then find the area of figure ABCD



[b] In the opposite figure :

$\overline{AD} \perp \overline{CB}$

, $\overline{AC} \perp \overline{AB}$



Prove that : $\Delta ABC \sim \Delta DBA \sim \Delta DAC$

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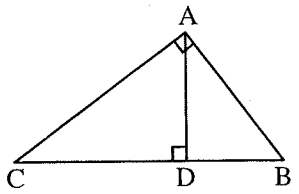
5 [a] In the opposite figure :

ΔABC is right-angled at A , $\overline{AD} \perp \overline{CB}$



Complete : (1) $(AD)^2$ = ... × .....

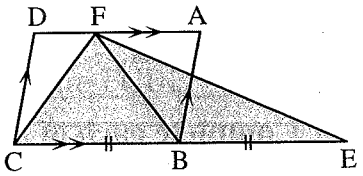
(2) $(AB)^2$ = ... × .....

(3) $(AC)^2$ = ... × .....

[b] ✻ In the opposite figure :

ABCD is a parallelogram.

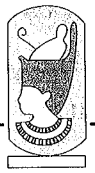
, $E \in \overrightarrow{CB}$, where BC = BE



Prove that : The area of ΔEFC = the area of $\square ABCD$

14 Souhag Governorate

Maths Inspection



Answer the following questions :

1 Choose the correct answer :

(1) In ΔABC if $(AB)^2 > (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

(2) The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 5 : 2

(3) ΔABC in which $(AB)^2 - (BC)^2 = (AC)^2$, m ($\angle$ B) = 40° , then m ($\angle$ A) = ...

(a) 40° (b) 50° (c) 90° (d) 130°

(4) If the ratio of enlargement between two similar triangles equals 1 , then the two triangle are .....

(a) congruent. (b) different. (c) right-angled. (d) coincide.

(5) A square of area 18 cm^2 , the length of its diagonal = ... cm.

(a) 9 (b) 36 (c) 6 (d) 12

(6) ✻ The two triangles drawn on a common base and their vertices located on a straight line parallel to the base are .....

(a) similar. (b) congruent. (c) equal in area. (d) equal in perimeter.

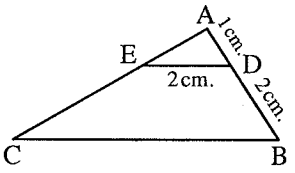
2 **Complete each of the following :**

① The two polygons are similar , if their corresponding sides lengths are ..... and their corresponding angles are .....

② In Δ ABC if $(AB)^2 = (BC)^2 - (AC)^2$, then m (∠ .....) = 90°

③ A trapezium whose parallel bases lengths are 12 cm. , 18 cm. and its height is 12 cm. , then its area equals ..... cm^2

④ **In the opposite figure :**



Δ ADE ~ Δ ABC

, then the length of BC ..... cm.

⑤ If ∠ A complements ∠ B and ∠ B supplements ∠ C and m (∠ A) = 30°

, then m (∠ C) = ...°

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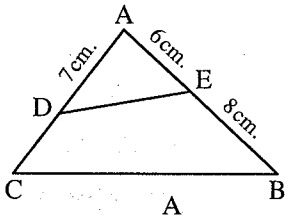
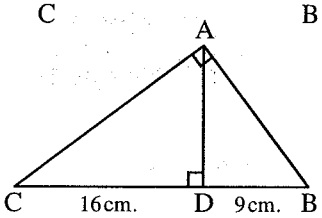
3 **[a] In the opposite figure :**



Δ ABC ~ Δ ADE , AE = 6 cm. , AD = 7 cm. , BE = 8 cm.

Find : ① The length of $\overline{DC}$ ② $\frac{DE}{BC}$

[b] In the opposite figure :



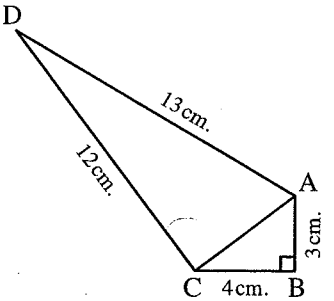
ABC is a right-angled triangle at A , $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm.

Find : The length of each of $\overline{AB}$, $\overline{AC}$, $\overline{AD}$

---

4 **[a]** The side lengths of one of two similar triangles are 3 cm. , 4 cm. and 5 cm. and the perimeter of the other triangle is 36 cm. , find the side lengths of the other triangle.

[b] In the opposite figure :



AB = 3 cm. , BC = 4 cm.

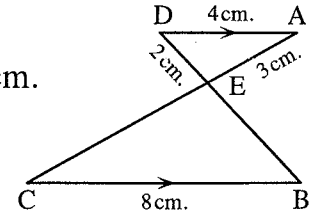
, AD = 13 cm. , CD = 12 cm.

, m (∠ B) = 90°

Prove that : m (∠ ACD) = 90°

---

5 **[a] In the opposite figure :**



$\overline{AD}$ // $\overline{BC}$, AD = 4 cm. , BC = 8 cm. , AE = 3 cm. and ED = 2 cm.

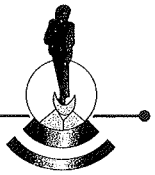
① **Prove that :** Δ AED ~ Δ CEB

② **Find :** The perimeter of Δ EBC

[b] The ratio between the lengths of diagonals of a rhombus is 5 : 8 and the area of this rhombus is 2000 cm^2 , find the lengths of its diagonals.

15 Red Sea Governorate

Directorate of Education
El-Quseir Governmental languages school



Answer the following questions :

1 Choose the correct answer :

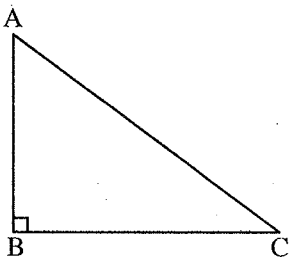
(1) The area of rhombus whose diagonals 6 cm. and 10 cm. = ... cm^2

(a) 60 (b) 30 (c) 10 (d) 6

(2) If ABC is an acute angled triangle at C , then $(AB)^2$ ..... $(BC)^2 + (AC)^2$

(a) < (b) = (c) > (d) ≤

(3) **In the opposite figure :**



The projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

(a) $\overline{AB}$ (b) $\overline{AC}$

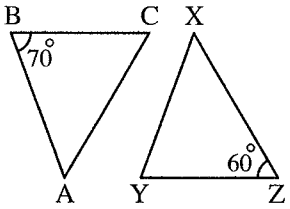
(c) $\overline{BC}$ (d) {B}

(4) The diagonals of an isosceles trapezium are .....

(a) parallel. (b) equal in length.

(c) not equal in length. (d) perpendicular.

(5) **In the opposite figure :**



If Δ ABC ~ Δ XYZ

, then m (∠ A) = ...

(a) 50° (b) 60°

(c) 70° (d) 110°

(6) * The triangle whose base length is 6 cm. and its area 30 cm^2

, the corresponding height = ...

(a) 5 (b) 36 (c) 10 (d) 15

---

2 Complete each of the following :

(1) The two polygons are similar , if their corresponding sides are ..... and their corresponding angles are .....

(2) If two polygons are similar and the ratio between the length of two corresponding sides is 2 : 5 , then the ratio between their perimeter is .....

(3) The area of square is 50 cm^2 , then the length of its diagonal is ..... cm.

(4) If the measure of the corresponding angles in the two triangles are equal in measure , then the two triangles are .....

(5) A square of perimeter 20 cm. , then its area equals ..... cm^2

3 **[a] In the opposite figure :**

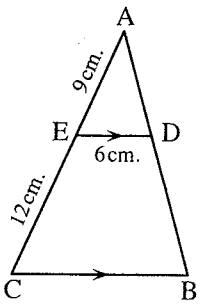
$\overline{ED} \parallel \overline{CB}$, AE = 9 cm.

, EC = 12 cm. and ED = 6 cm.

Prove that :

(1) $\Delta ABC \sim \Delta ADE$

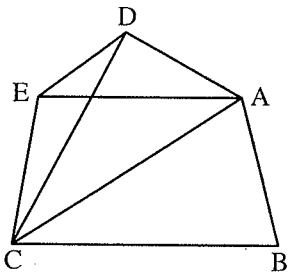
(2) **Find :** The length of $\overline{CB}$



[b] ✻ In the opposite figure :

The area of the figure ABCD = the area of the figure ABCE

Prove that : $\overline{DE} \parallel \overline{AC}$



---

4 **[a]** Find the height of a trapezium with area of 450 cm^2 and the two base lengths are 24 cm. and 12 cm.

[b] Find the area of a square whose diagonal length is 8 cm.

---

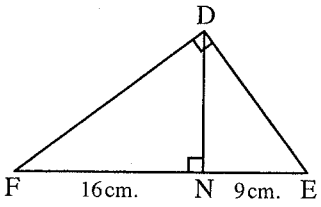
5 **[a] In the opposite figure :**

DEF is a right-angled triangle at D

, $\overline{DN} \perp \overline{EF}$, EN = 9 cm.

and FN = 16 cm.

Find : The length of each of $\overline{DE}$ and $\overline{DN}$



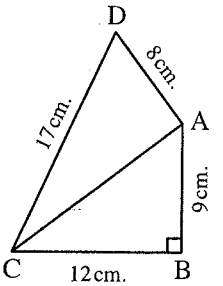
[b] In the opposite figure :

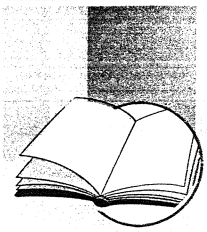
ABCD is a quadrilateral

, m (∠ B) = 90° , AB = 9 cm. , BC = 12 cm.

, CD = 17 cm. and DA = 8 cm.

Prove that : m (∠ DAC) = 90°





Some Schools Examinations

1 Cairo Governorate

Zeitoun Educational Administration
Gomhouria Language School

Answer the following questions :

1 Choose the correct answer :

(1) In Δ ABC : If $(AB)^2 > (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

(2) The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 5 : 2

(3) ABC is a right-angled triangle at B , $\overline{BD} \perp \overline{AC}$, then the projection of $\overline{BD}$ on $\overline{AC}$ is the point .....

(a) A (b) B (c) C (d) D

(4) If $\overline{AB} \parallel \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) $\leq$

(5) If the ratio of an enlargement between two triangles equals 1 , then the two triangles are .....

(a) congruent. (b) different. (c) right-angled. (d) coincide.

---

2 Complete :

(1) The two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

(2) If the point A $\in$ the straight line L , then the projection of the point A on this straight line is .....

(3) In Δ ABC : If $(XY)^2 + (YZ)^2 = (XZ)^2$, then m ($\angle$ .....) = 90°

(4) The two polygons that are similar to a third are .....

(5) If two triangles are similar , then their corresponding angles are .....

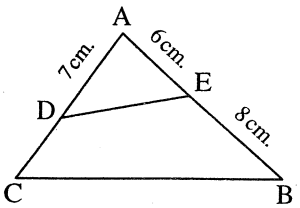
---

3 [a] In the opposite figure :

If $\Delta ABC \sim \Delta ADE$, AE = 6 cm.

, AD = 7 cm. and BE = 8 cm.

Find : (1) DC (2) $\frac{DE}{BC}$

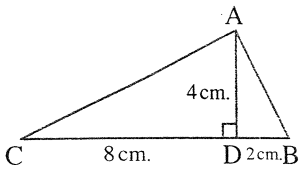


[b] In the opposite figure :

ABC is a triangle in which : BD = 2 cm.

, CD = 8 cm. , AD = 4 cm. , $\overline{AD} \perp \overline{BC}$

Prove that : m (∠ BAC) = 90°



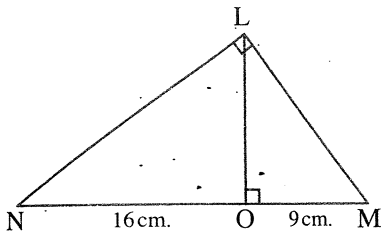
4 [a] Determine the type of the angle C in Δ ABC in which AB = 7 cm. , BC = 3 cm. and AC = 5 cm.

[b] In the opposite figure :

LMN is a right-angled triangle at L ,

$\overline{LO} \perp \overline{MN}$, MO = 9 cm. and NO = 16 cm.

Find : The length of each of $\overline{LM}$, $\overline{LN}$ and $\overline{LO}$



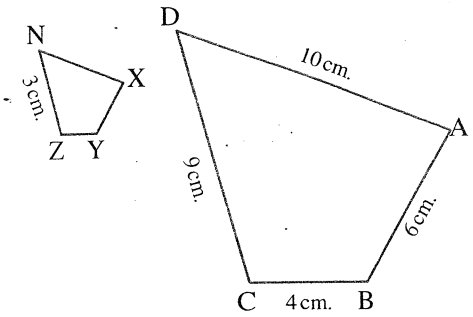
5 In the opposite figure :

The polygon ABCD ~ the polygon XYZN,

AB = 6 cm. , BC = 4 cm. , CD = 9 cm. ,

DA = 10 cm. and ZN = 3 cm.

Find : The length of each of $\overline{XY}$, $\overline{YZ}$ and $\overline{XN}$



Additional question

[a] Complete each of the following :

(1) The median of a triangle divides its surface into .....

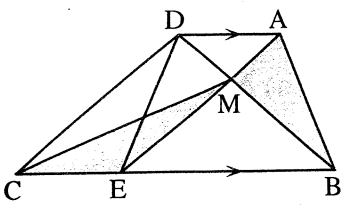
(2) If the area of a trapezium is 75 cm^2 and the length of its middle base is 15 cm. , then its height ..... cm.

[b] In the opposite figure :

$\overline{AD} // \overline{BC}$, $\overline{AE} \cap \overline{BD} = \{M\}$

, the area of Δ AMB = the area of Δ EMC

Prove that : $\overline{ME} // \overline{DC}$



2 Cairo Governorate

Abdeen Directorate
Patriarchal College

Answer the following questions :

1 Complete :

(1) In a triangle , if the square of the length of a side is equal to the sum of the squares of the lengths of the other two sides , then the angle opposite to this side is a .....

(2) If $\overline{AB} \perp \overline{BC}$, then the projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ is .....

(3) If ABC in an isosceles triangle , AB = AC = 5 cm. and BC = 6 cm., then the length of projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is ..... cm.

(4) The two polygons are similar if their corresponding sides lengths are ..... and their corresponding angles are .....

(5) In triangle ABC : If $(AB)^2 - (AC)^2 < (BC)^2$, then $\angle C$ is .....

2 Choose the correct answer :

(1) The length of the projection of a given line segment ..... the length of the original line segment.

(a) < (b) ≤ (c) > (d) ≥

(2) The ratio between the lengths of corresponding sides of two similar triangle is 3 : 5 , if the perimeter of the greater triangle is 60 cm. , then the perimeter of the smaller triangle is ..... cm.

(a) 24 (b) 36 (c) 40 (d) 100

(3) If $\Delta ABC \sim \Delta DEO$, $AB = \frac{1}{4} DE$, then the perimeter of ΔABC equals ..... the perimeter of ΔDEO

(a) 4 (b) 2 (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

(4) If ABC is an obtuse-angled triangle at A in which AB = 5 cm. , BC = 8 cm. , then AC = ... cm.

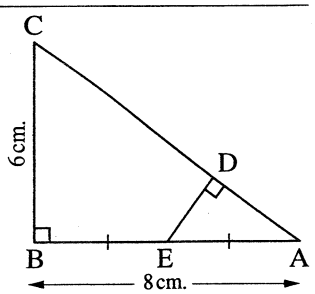
(a) 5 (b) 7 (c) 8 (d) 13

(5) ΔABC in which : $(AB)^2 - (BC)^2 = (AC)^2$, m ($\angle B$) = 40° , then m ($\angle A$) = ...

(a) 40° (b) 50° (c) 90° (d) 130°

3 [a] In the opposite figure :

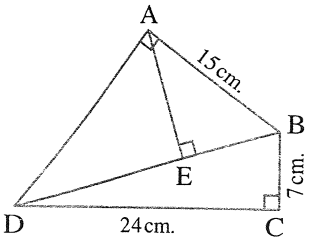
ABC is a right-angled triangle at B ,
E is the midpoint of $\overline{AB}$, $\overline{ED} \perp \overline{AC}$
, AB = 8 cm. , BC = 6 cm.
Find : The length of $\overline{ED}$



[b] Find the length of $\overline{BC}$ in the triangle ABC , in which : $(AB)^2 > (AC)^2 + (BC)^2$,
AB = 15 cm. , AC = 13 cm. , $\overline{AD} \perp \overrightarrow{BC}$ and intersects it at D , AD = 12 cm.

4 **[a] In the opposite figure :**

ABCD is a quadrilateral , where
m (∠ BCD) = m (∠ BAD) = 90° ,
$\overline{AE} \perp \overline{BD}$, BC = 7 cm.
, CD = 24 cm. , AB = 15 cm.

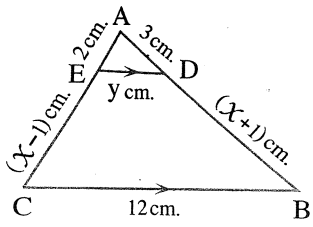


Find : (1) The length of the projection of $\overline{BD}$ on $\overleftrightarrow{AD}$
(2) The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BD}$
(3) The length of the projection of $\overline{AD}$ on $\overleftrightarrow{AE}$

[b] In the opposite figure :

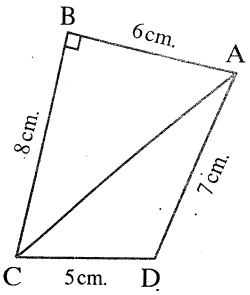
$\overline{ED} // \overline{BC}$

Find : The values of $\mathcal{X}$ and y



5 **[a] In the opposite figure :**

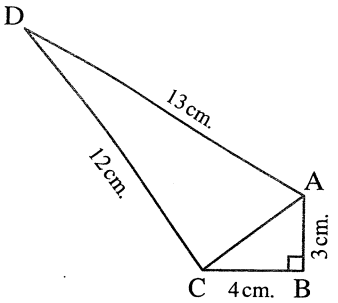
ABCD is a quadrilateral in which :
m (∠ B) = 90° , AB = 6 cm. BC = 8 cm.
, AD = 7 cm. and DC = 5 cm.
Determine the type of the angle which has
the greatest measure in triangle ACD



[b] In the opposite figure :

AB = 3 cm. , BC = 4 cm. , AD = 13 cm.
, CD = 12 cm., m (∠ ABC) = 90°

Prove that : m (∠ ACD) = 90°



Additional question

[a] Choose the correct answer :

(1) A rhombus is of two diagonal lengths 8 cm. and 6 cm. , its area = ... cm^2

(a) 14 (b) 24 (c) 48 (d) 20

(2) The height of the triangle whose area is 24 cm^2 , and its corresponding base length is 8 cm. equals ..... cm.

(a) 3 (b) 8 (c) 4 (d) 6

[b] In the opposite figure :

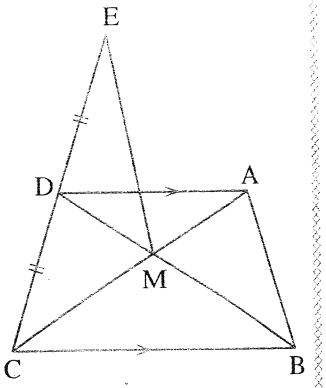
$\overline{AD} \parallel \overline{BC}$,

$\overline{AC} \cap \overline{BD} = \{M\}$,

D is the midpoint of $\overline{EC}$

Prove that :

The area of Δ MDE = the area of Δ AMB



3 Cairo Governorate

El Waili Educational Directorate
Notre Dame Desapotres School

Answer the following questions :

1 Choose the correct answer :

(1) The triangle whose side lengths are 4 cm., 5 cm. and 6 cm. is ..... -angled triangle.

(a) acute (b) obtuse (c) right (d) isosceles

(2) If $\overline{AB} \parallel \overline{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) > (b) ≥ (c) = (d) <

(3) The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

(4) If the ratio of enlargement between two triangles equal 1 , then the two triangles are .....

(a) congruent. (b) different. (c) right-angled. (d) coincide.

(5) If $\Delta ABC \sim \Delta DEF$ and m ($\angle B$) + m ($\angle C$) = 70 , than m ($\angle D$) = ...

(a) 70° (b) 90° (c) 110° (d) 180°

2 Complete :

(1) ABC is a triangle, if $(AC)^2 + (CB)^2 = (AB)^2 - 9$, then angle C is .....

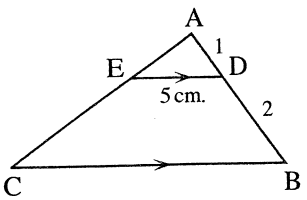
(2) Two polygons are similar if corresponding sides lengths are .....

and their corresponding angles are .....

(3) **In the opposite figure :**

$\Delta ABC \sim \Delta ADE$, AD : DB = 1 : 2, if ED = 5 cm.

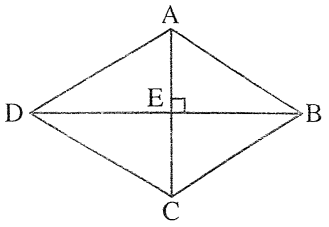
, then BC = ... cm.



(4) **In the opposits figure :**

ABCD is a rhombus, then the

projection of $\overline{AD}$ on $\overleftrightarrow{AC}$ is .....



(5) ABC is a triangle, AB = 12 cm. , BC = 5 cm. and AC = 13 cm.

, then m (∠ .....) = 90°

---

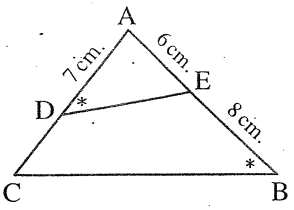
3 **[a] In the opposite figure :**

ABC is a triangle, m (∠ ADE) = m (∠ ABC)

, AE = 6 cm. , EB = 8 cm. , AD = 7 cm.

(1) **Prove that :** Δ AED ~ Δ ACB

(2) **Find :** The length of $\overline{CD}$



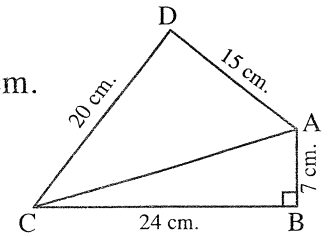
[b] In the opposite figure :

ABCD is aquadrilateral in which : m (∠ ABC) = 90° , AB = 7 cm.

, BC = 24 cm. , CD = 20 cm. and AD = 15 cm.

(1) **Find :** The length of $\overline{AC}$

(2) **Prove that :** m (∠ ADC) = 90°



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4 **[a] In the opposite figure :**

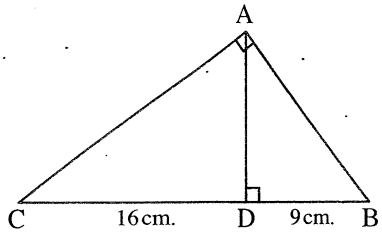
m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

Complete :

(1) The projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

(2) AB = ... cm.

(3) AD = ... cm.



[b] Δ ABC ~ Δ EFD , AB = 4 cm. , BC = 5 cm. , AC = 6 cm., if the perimeter of triangle EFD = 60 cm.

Find : The lengths of the sides of Δ EFD

---

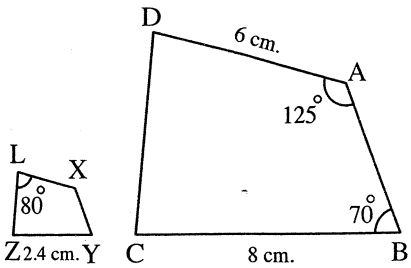
5 **[a] In the opposite figure :**

The polygon ABCD ~ the polygon XYZL

Calculate : (1) m (∠ BCD)

(2) The length of $\overline{XL}$

and determine the enlargement ratio.



[b] **In the opposite figure :**

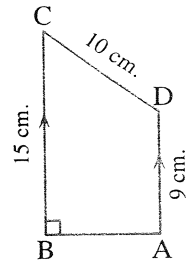
ABCD is a trapezium in which :

$\overline{AD}$ // $\overline{BC}$ and m (∠ ABC) = 90°

If AD = 9 cm. , DC = 10 cm. and CB = 15 cm.

Find : (1) The length of the projection of $\overline{DC}$ on $\overleftrightarrow{BC}$

(2) The length of the projection of $\overline{DC}$ on $\overleftrightarrow{AB}$



Additional question

[a] **Complete each of the following :**

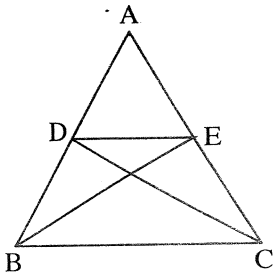
(1) If the area of a parallelogram is 35 cm^2 and the length of one base is 10 cm. , then the corresponding height of this base is ..... cm.

(2) Triangles whose bases are equal in length and lying between two parallel straight lines are .....

[b] **In the opposite figure :**

If the area of Δ ACD = the area of Δ ABE

Prove that : $\overline{ED}$ // $\overline{BC}$



4 Giza Governorate

El-Haram Directorate
The Egyptian International School

Answer the following questions :

1 Complete :

(1) The two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

(2) In Δ ABC : if $(AB)^2 = (BC)^2 - (AC)^2$, m (∠ .....) = 90°

(3) If the ratio of enlargement between two triangles equals 1 , then the two triangles are .....

(4) The projection of a point on a given straight line is .....

(5) ABC is a triangle in which : $(AB)^2 < (AC)^2 + (BC)^2$, then ∠ C is .....

2 Choose the correct answer :

(1) ABC is a triangle in which : $(BC)^2 = (AB)^2 + (AC)^2$, m (∠ B) = 40° , then m (∠ C) = ...

(a) 90° (b) 40° (c) 50° (d) 60°

(2) A triangle whose side lengths are 6 cm. , 8 cm. and 11 cm. , then its type according to its angles is ..... -angled triangle.

(a) right (b) obtuse (c) acute (d) straight

(3) If $\Delta ABC \sim \Delta DEF$ and $m(\angle B) + m(\angle C) = 70°$, then $m(\angle D) =$ .....

(a) 70° (b) 35° (c) 140° (d) 110°

(4) The length of the projection of a line segment on a given straight line ..... the length of the original line segment.

(a) < (b) ≤ (c) ≥ (d) =

(5) If $\Delta ABC \sim \Delta XYZ$, AB = 5 cm. , XY = 10 cm. and YZ = 8 cm., then BC = ... cm.

(a) 3 (b) 4 (c) 5 (d) 6

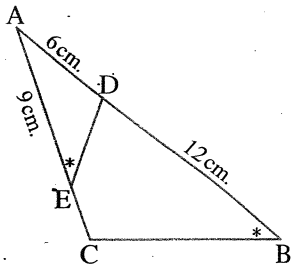
3 In the opposite figure :

$m(\angle AED) = m(\angle B)$, AD = 6 cm.

AE = 9 cm. , DB = 12 cm.

(1) **Prove that :** $\Delta ADE \sim \Delta ACB$

(2) **Find :** The length of $\overline{EC}$



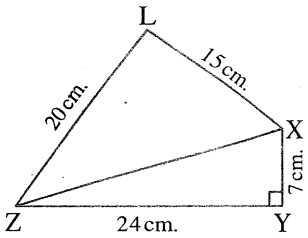
4 In the opposite figure :

$m(\angle XYZ) = 90°$, XY = 7 cm.,

YZ = 24 cm. , LX = 15 cm. , LZ = 20 cm.

(1) **Find :** The length of $\overline{XZ}$

(2) **Prove that :** $m(\angle XLZ) = 90°$



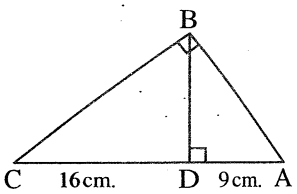
5 In the opposite figure :

ΔABC is a right-angled at B , $\overline{BD} \perp \overline{AC}$,

AD = 9 cm. and CD = 16 cm.

Find : (1) The length of $\overline{AB}$

(2) The length of $\overline{BD}$



Additional question

[a] Choose the correct answer :

(1) The area of the triangle is equal to ..... the area of the parallelogram which has a common base and its vertex lies on the straight line parallel to this base.

(a) equal to (b) half (c) twice (d) quarter

(2) A square of area 18 cm^2 the length of its diagonal = ... cm.

(a) 9 (b) 36 (c) 6 (d) 12

[b] The areas of two lands are equal. The first is in the shape of a rhombus where the lengths of its diagonals are 12 m. and 30 m. The second is in the shape of rectangle where the ratio between its two dimensions is 4 : 5 find the lengths of these dimensions.

5 Giza Governorate

Bulak El Dakror Directorate
Dar El Hanan Language School

Answer the following questions :

1 Choose the correct answer from the given ones :

(1) The length of the projection of a given line segment ..... the length of the original line.

(a) < (b) > (c) ≤ (d) ≥

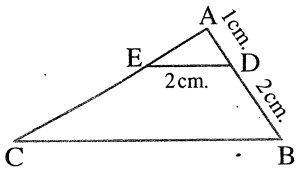
(2) Δ ABC in which : AB = 3 cm. , BC = 5 cm. and AC = 4 cm. , then m (∠ B) ..... 90°

(a) < (b) > (c) = (d) twice

(3) **In the opposite figure :**

If Δ ADE ~ Δ ABC

, then the length of $\overline{BC}$ equals ..... cm.



(a) 3 (b) 4 (c) 6 (d) 8

(4) The diagonal length of a square whose area is 50 cm^2 equals ..... cm.

(a) 10 (b) 30 (c) 40 (d) 50

(5) ABC is triangle in which : $(AB)^2 = (AC)^2 + (BC)^2$ and m (∠ B) = 40° ,

then m (∠ A) = ...

(a) 40° (b) 50° (c) 90° (d) 130°

---

2 Complete :

(1) The two triangles are similar if the corresponding ..... are equal in measure.

(2) In triangle ABC if $(AC)^2 + (AB)^2 < (BC)^2$, then angle A is .....

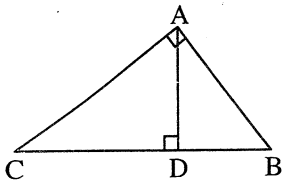
(3) If the ratio between two corresponding side lengths in two similar polygons is 3 : 4

, then the ratio between their perimeters equals .....

(4) The projection of a point on a given straight line is .....

(5) **In the opposite figure :**

Δ ABC ~ Δ .....



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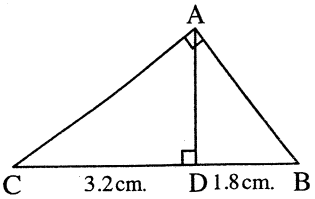
3 [a] In the opposite figure :

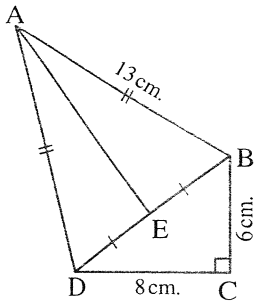
Δ ABC is right-angled at A ,

$\overline{AD} \perp \overline{BC}$, BD = 1.8 cm. , CD = 3.2 cm.

Find : The length of each of $\overline{AC}$ and $\overline{AD}$



[b] In the opposite figure :



ABCD is a quadrilateral in which : m (∠ C) = 90° ,

AB = AD = 13 cm. , BC = 6 cm. ,

CD = 8 cm. and E is the midpoint of $\overline{BD}$

Find : The area of the quadrilateral ABCD

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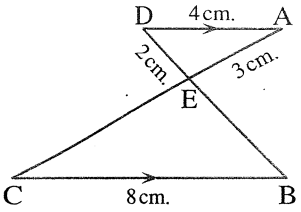
4 **[a] In the opposite figure :**



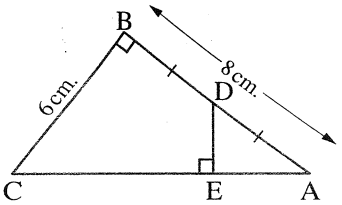
$\overline{AD}$ // $\overline{BC}$, AD = 4 cm. , BC = 8 cm. ,

AE = 3 cm. and and ED = 2 cm.

(1) **Prove that :** Δ AED ~ Δ CEB

(2) **Find :** The perimeter of Δ EBC

[b] In the opposite figure :



ABC is a right-angled triangle at B

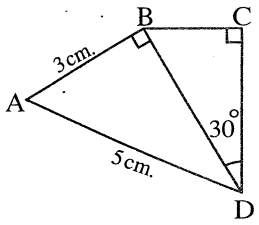
, D is the midpoint of $\overline{AB}$, $\overline{DE} \perp \overline{AC}$

, AB = 8 cm. , BC = 6 cm.

Find : The length of $\overline{DE}$

---

5 **[a] In the opposite figure :**

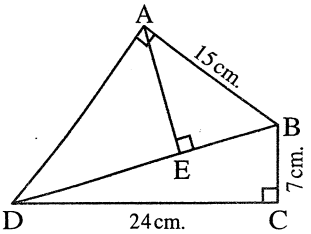


ABCD is a quadrilateral in which : m (∠ ABD) = 90° ,

m (∠ BCD) = 90° , m (∠ BDC) = 30° , AB = 3 cm. , AD = 5 cm.

Find : The length of $\overline{BC}$

[b] In the opposite figure :



ABCD is a quadrilateral where :

m (∠ BCD) = m (∠ BAD) = 90° , $\overline{AE} \perp \overline{BD}$,

BC = 7 cm. , CD = 24 cm. and AB = 15 cm.

Find : The length of each of $\overline{BD}$, $\overline{AD}$ and $\overline{AE}$

Additional question

[a] Complete :

(1) A trapezium whose two parallel bases lengths are 12 cm. , 18 cm. and its height is 12 cm. , then its area equals ..... cm^2

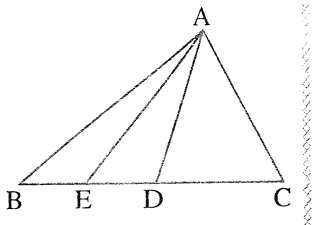
(2) **In the opposite figure :**

ABC is a triangle , D is the midpoint of $\overline{BC}$

and E is the midpoint of $\overline{BD}$

If the area of Δ ABC is 60 cm^2

, then the area of Δ ABE = ... cm^2



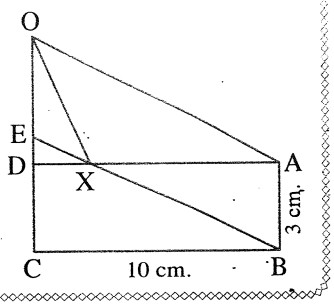
[b] **In the opposite figure :**

ABCD is a rectangle ,

ABEO is a parallelogram ,

AB = 3 cm. and BC = 10 cm.

Find with proof : The area of Δ AXO



6 Alexandria Governorate

East Educational Zone
English Language Schools

Answer the following questions : (Allows the use of a calculator)

1 Complete the following :

(1) The ratio between the lengths of two corresponding sides in two congruent polygons = ...

(2) The line segment joining the midpoints of two sides in triangle ..... to the third side.

(3) In triangle XYZ , if m (∠ X) = 90° , then the projection of $\overline{YZ}$ on $\overleftrightarrow{XY}$ is .....

(4) In triangle ABC , if m (∠ A) = 90° , $\overline{AD} \perp \overline{BC}$ and cuts it at D , then $(AC)^2$ = ... × .....

(5) If $(AB)^2 < (AC)^2 + (BC)^2$, then ∠ ACB is an ..... angle.

2 Choose the correct answer :

(1) If two triangles are similar , then the lengths of the corresponding sides are .....

(a) congruent. (b) equal. (c) proportional. (d) parallel.

(2) If ∠ ABC is an obtuse angle , then BC ..... AC – AB

(a) > (b) < (c) = (d) ≡

(3) If $\overline{AC}$ is the projection of $\overline{AB}$, then AC ..... AB

(a) < (b) ≥ (c) ≤ (d) >

(4) In triangle ABC , if $\overline{AD} \perp \overline{BC}$ and cuts it at D , where AB = 15 cm. , AC = 20 cm. and BC = 25 cm. , then AD = ... cm.

(a) 21 (b) 12 (c) 15 (d) 25

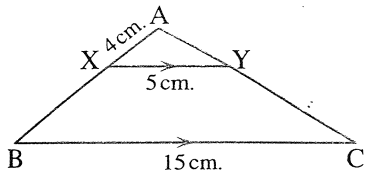
(5) In Δ ABC , if m (∠ B) > m (∠ C) , then AC ..... AB

(a) < (b) > (c) = (d) ≥

3 **[a] In the opposite figure :**

$\overline{XY}$ // $\overline{BC}$, AX = 4 cm. , XY = 5 cm. , BC = 15 cm.

Find with proof : The length of $\overline{XB}$



[b] Determine the type of triangle ABC where AB = 9 cm. , BC = 10 cm. and AC = 15 cm.

4 **[a] In the opposite figure :**

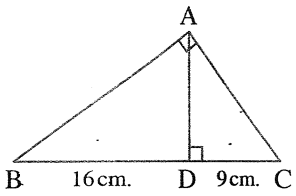
Complete :

(1) The projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ = ...

(2) The projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ = ...

(3) The projection of $\overline{AD}$ on $\overleftrightarrow{BC}$ = ...

(4) The projection of $\overline{BC}$ on $\overleftrightarrow{AC}$ = ...



[b] From the previous figure :

If BD = 16 cm. and DC = 9 cm. , then find the length of each of $\overline{AD}$, $\overline{AB}$, $\overline{AC}$

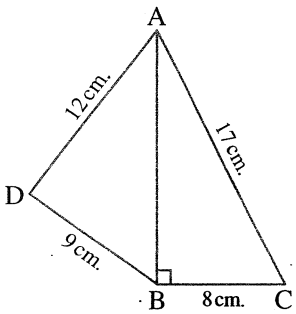
5 **[a] In the opposite figure :**

ABC is a right-angled triangle at B ,

AC = 17 cm. , CB = 8 cm. , AD = 12 cm.

and DB = 9 cm.

Prove that : m (∠ ADB) = 90°

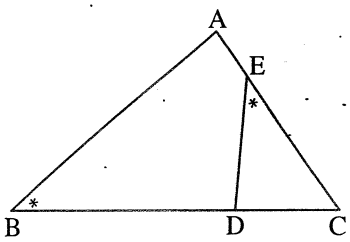


[b] In the opposite figure :

m (∠ B) = m (∠ DEC)

Prove that :

Δ ABC ~ Δ DEC



Additional question

[a] Choose the correct answer :

(1) The two base angles of the isosceles trapezium are .....

(a) parallel. (b) congruent. (c) complementary. (d) supplementary.

(2) A square of perimeter 20 cm. , then its area = ... cm^2

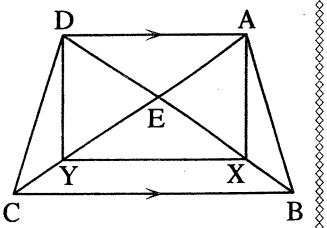
(a) 20 (b) 50 (c) 25 (d) 100

[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$

, the area of Δ AXB = the area of Δ DYC

Prove that : $\overline{XY}$ // $\overline{AD}$



7 El-Kalyoubia Governorate

Central Maths Supervision

Answer the following questions :

1 Choose the correct answer :

(1) In Δ ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then the angle C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

(2) ABC is a right-angled triangle at B , $\overline{BD} \perp \overline{AC}$, then the projection of $\overline{BD}$ on $\overleftrightarrow{AC}$ is .....

(a) {A} (b) {B} (c) {C} (d) {D}

(3) If Δ ABC $\sim$ Δ DEF and $AB = \frac{1}{5}$ DE , then the perimeter of Δ ABC = ... the perimeter of Δ DEF .

(a) 5 (b) 1 (c) $\frac{1}{5}$ (d) $\frac{2}{5}$.

(4) If the ratio of enlargement between two similar triangles equals ..... , then the two triangles are congruent.

(a) 1 (b) 2 (c) 0.5 (d) 0.25

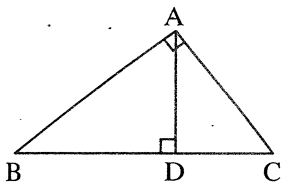
(5) If Δ ABC is right-angled at A and $\overline{AD} \perp \overline{BC}$, then $AC \times AB = AD \times$ .....

(a) CD (b) DB (c) AD (d) CB

2 Complete :

In the opposite figure :

Δ ABC is right-angled at A , $\overline{AD} \perp \overline{BC}$, then :



(1) $(AC)^2$ = ... + ...

(2) $(AC)^2$ = ... – .....

(3) $(AC)^2$ = ... × .....

(4) Δ ABC $\sim$ Δ .....

3 [a] ABCD is a parallelogram in which : AB = 8 cm. , AC = 20 cm. and BD = 12 cm.

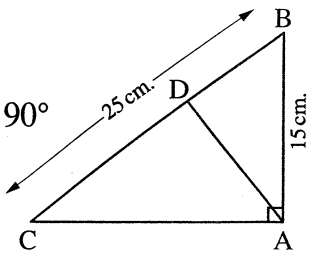
Prove that : m ($\angle$ ABD) = 90°

[b] In the opposite figure :

AB = 15 cm. , BC = 25 cm. and Δ DBA $\sim$ Δ ABC , m ($\angle$ BAC) = 90°

(1) **Prove that :** $\overline{AD} \perp \overline{BC}$

(2) **Find :** The length of $\overline{BD}$



4 [a] Determine the type of Δ ABC according to its angles

If AB = 2.5 cm. , BC = 1.5 cm. , and AC = 2 cm.

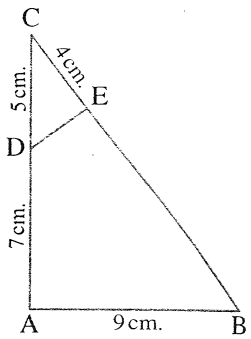
[b] **In the opposite figure :**

Δ CDE ~ Δ CBA ,

if CD = 5 cm. , AD = 7 cm. ,

CE = 4 cm. and AB = 9 cm.

Find : BE , DE



5 [a] Δ ABC is obtuse - angled at C , $\overline{AD} \perp \overleftrightarrow{BC}$, AB = 15 cm. , AC = 13 cm. , AD = 12 cm.

Find : The length of $\overline{BC}$

[b] ABC is a triangle , $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ are bisected at D , E and F respectively.

Prove that : Δ ABC ~ Δ EFD

Additional question

[a] Complete the following :

(1) The median of a triangle divides its surface into two triangles .....

(2) Surfaces of two parallelograms with common base and between two parallel straight lines , one is carrying this base .....

[b] The ratio between the lengths of the two diagonals of a rhombus is 5 : 8 , if its area is 2000 cm^2. , find the length of each of its diagonals.

8 El-Sharkia Governorate

Directorate of Education
Dep. of Governmental L. School

Answer the following questions :

1 Choose the correct answer :

(1) If $\overline{AB} \perp \overline{BC}$, then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

(a) $\overline{AB}$ (b) $\overline{BC}$ (c) {B} (d) $\overline{AC}$

(2) In Δ XYZ , if $(XY)^2 = (XZ)^2 - (YZ)^2$, then $\angle$ Y is ..... angle.

(a) right (b) acute (c) obtuse (d) straight

(3) If the length of a rectangle is 8 cm. and its width is 6 cm. , then the length of its diagonal is .....

(a) 8 cm. (b) 6 cm. (c) 9 cm. (d) 10 cm.

(4) If the ratio between two corresponding side lengths in similar two triangles is 1 : 3 , then the ratio between their perimeters is .....

(a) 3 : 1 (b) 2 : 4 (c) 1 : 3 (d) 1 : 1

(5) If ABC is an obtuse-angled triangle at A , in which : AB = 5 cm. , BC = 8 cm. , then AC = ... cm.

(a) 5 (b) 7 (c) 8 (d) 3

2 Complete the following :

(1) The two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

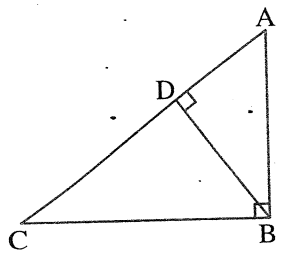
(2) If M is the midpoint of $\overline{AB}$, then $(AB)^2$ = ... $(AM)^2$

(3) Any two squares are .....

(4) **From the opposite figure :**

(i) $(AB)^2$ = ... + ...

(ii) $(BC)^2$ = ... × .....



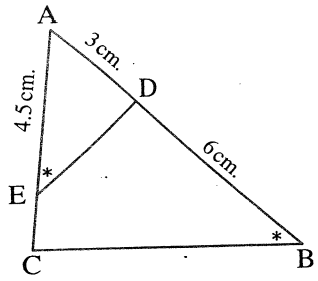
3 [a] In the opposite figure :

m (∠ AED) = m (∠ B) , AD = 3 cm. ,

AE = 4.5 cm. , BD = 6 cm.

(1) **Prove that :** Δ ADE ~ Δ ACB

(2) **Find :** The length of $\overline{CE}$

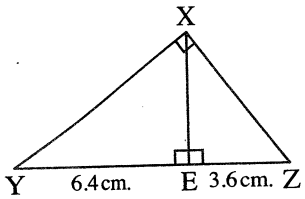


[b] In the opposite figure :

XYZ is a right-angled triangle at X , $\overline{XE} \perp \overline{YZ}$

If EY = 6.4 cm. , EZ = 3.6 cm.

Find : The length of each of : $\overline{XE}$ and $\overline{XY}$



4 In the opposite figure :

ABCD is a quadrilateral , where :

m (∠ BCD) = 90° , $\overline{AE} \perp \overline{BD}$,

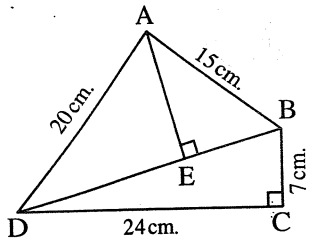
BC = 7 cm. , CD = 24 cm. ,

AD = 20 cm. and AB = 15 cm.

(1) **Find :** The length of $\overline{BD}$

(2) **Prove that :** m (∠ BAD) = 90°

(3) **Find :** The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BD}$



5 [a] Determine the type of the greatest angle in Δ ABC where :

AB = 8 cm. , BC = 10 cm. and AC = 7 cm.

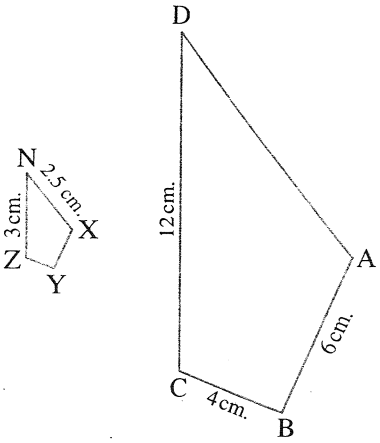
[b] **In the opposite figure :**

The polygon ABCD ~ The polygon XYZN

AB = 6 cm. , BC = 4 cm. ,

CD = 12 cm. , NX = 2.5 cm. , ZN = 3 cm.

Find : The length of each of $\overline{XY}$, $\overline{YZ}$ and $\overline{AD}$



Additional question

[a] Choose the correct answer :

(1) If the lengths of the parallel bases of a trapezium are 10 cm. and 8 cm. and its height is 5 cm. , then its area = ... cm^2

(a) 40 (b) 50 (c) 45 (d) 90

(2) ABCD is a parallelogram , E ∈ $\overline{BC}$,

then the area of ▱ ABCD = ... the area of Δ EAD

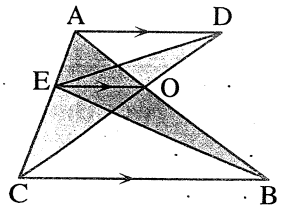
(a) the same (b) half (c) twice (d) third

[b] In the opposite figure :

$\overline{AD}$ // $\overline{EO}$ // $\overline{CB}$

Prove that :

Area of Δ DEC = area of Δ AEB



9 El-Monofia Governorate

Official Language Schools
The Central Maths Supervision

Answer the following questions :

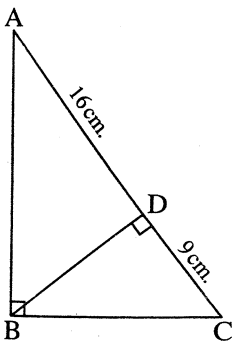
1 **Choose the correct answer :**

(1) **In the opposite figure :**

The length of $\overline{BD}$ is ..... cm.

(a) 9 (b) 16

(c) 12 (d) 15



(2) Δ ABC is an acute-angled triangle where AB = 6 cm. ,

BC = 8 cm. , then AC = ... cm.

(a) 2 (b) 7 (c) 10 (d) 14

(3) The ratio between the lengths of two corresponding side lengths of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

(4) The projection of any point on a straight line is .....

(a) line segment. (b) ray. (c) straight line. (d) point.

(5) If $\Delta ABC \sim \Delta XYZ$, AB = 5 cm. , XY = 10 cm. and YZ = 8 cm. , then BC = ... cm.

(a) 3 (b) 4 (c) 5 (d) 6

2 Complete the following :

(1) The two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

(2) A triangle whose side lengths are 6 cm. , 8 cm. and 11 cm. , its type according to its angles is .....

(3) In ΔABC , if $(AC)^2 + (CB)^2 = (AB)^2 - 9$, then angle C is .....

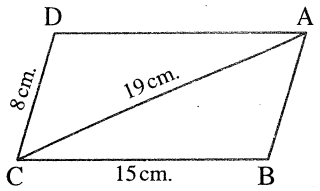
(4) If $\overrightarrow{AD} \perp \overleftrightarrow{BC}$, then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is .....

(5) All squars are.....

3 [a] In the opposite figure :

ABCD is a parallelogram in which : BC = 15 cm. , AC = 19 cm. , DC = 8 cm.

Prove that : $\angle ABC$ is obtuse.



[b] Two triangles are similar , the length of the sides of one of them are 6 cm. , 8 cm. , 10 cm. and the perimeter of the other is 72 cm.

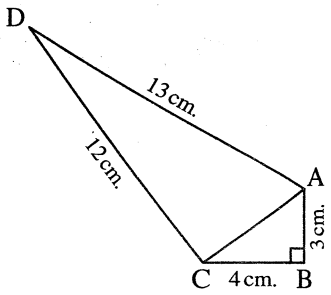
Find : The length of sides of the other triangle.

4 [a] In the opposite figure :

BC = 4 cm. , AD = 13 cm. , AB = 3 cm. , DC = 12 cm. , m ($\angle$ B) = 90°

(1) **Find :** The length of $\overline{AC}$

(2) **Prove that :** m ($\angle$ ACD) = 90°

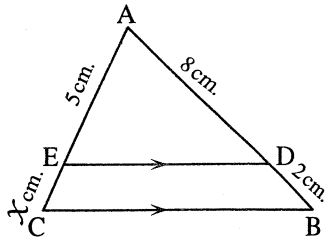


[b] In the opposite figure :

ABC is a triangle in which : $\overline{DE} // \overline{BC}$, BD = 2 cm. , AD = 8 cm. , AE = 5 cm. , CE = x cm.

(1) **Prove that :** $\Delta ADE \sim \Delta ABC$

(2) **Find :** The value of x



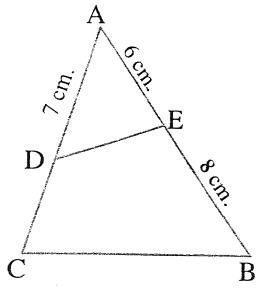
5 **[a] In the opposite figure :**

$\Delta ABC \sim \Delta ADE$

, AE = 6 cm. , AD = 7 cm. , BE = 8 cm.

Find : (1) The length of $\overline{DC}$

(2) $\frac{DE}{BC}$



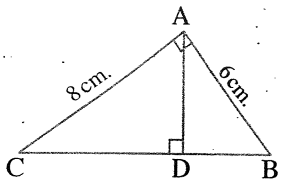
[b] In the opposite figure :

ABC is a right-angled triangle at A , $\overline{AD} \perp \overline{BC}$

Find with proof :

(1) The length of each of $\overline{BC}$ and $\overline{AD}$

(2) The length of the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$



Additional question

[a] Complete the following :

(1) The diagonals of the isosceles trapezium are .....

(2) The area of the rhombus of perimeter 20 cm. and height 3 cm. = ...

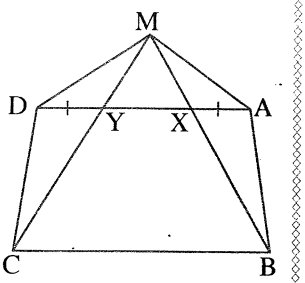
[b] In the opposite figure :

ABCD is a quadrilateral.

$X \in \overline{AD}$ and $Y \in \overline{AD}$ such that AX = YD

, the area of ΔABM = the area of ΔDCM

Prove that : $\overline{AD} // \overline{BC}$



10 Suez Governorate

Educational Directorate
Maths Inspectorate

Answer the following questions :

1 **Complete :**

(1) In ΔABC , if $(AB)^2 = (BC)^2 + (AC)^2$, then m ($\angle$ .....) = 90°

(2) If $\overline{AD} \perp \overleftrightarrow{BC}$, then the projection of $\overline{AD}$ on $\overleftrightarrow{BC}$ is .....

(3) Two polygons are similar if their corresponding side lengths are ..... and their corresponding angles are .....

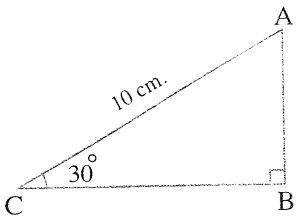
(4) A triangle whose side lengths are 6 cm. , 8 cm. , 11 cm. , then its type according to its angle is .....

(5) **In the opposite figure :**

AC = 10 cm. , m (∠ C) = 30° ,

m (∠ B) = 90°

AB = ... cm.



2 Choose the correct answer :

(1) If $\overline{AB}$ // $\overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) > (b) = (c) ≤ (d) <

(2) In Δ ABC , if $(AB)^2 > (AC)^2 + (BC)^2$, then ∠ C is ..... angle.

(a) acute (b) obtuse (c) right (d) straight

(3) If Δ ABC ~ Δ DEO , $AB = \frac{1}{4}$ DE

, then the perimeter of Δ ABC = ... the perimeter of Δ DEO

(a) 4 (b) 2 (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

(4) ABC is a right-angled triangle at B , AC = 10 cm. , BC = 8 cm. , AB = ... cm.

(a) 8 (b) 6 (c) 4 (d) 5

(5) If the ratio of enlargement between two triangles equals 1 , then the two triangles are .....

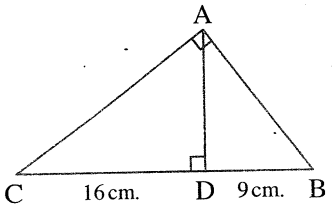
(a) congruent. (b) different. (c) right-angled.

3 [a] In the opposite figure :

m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$,

BD = 9 cm. , DC = 16 cm.

Find : The length of each of $\overline{AD}$, $\overline{AB}$ and $\overline{AC}$

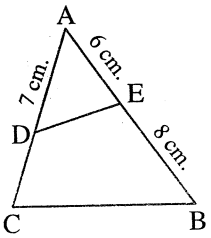


[b] In the opposite figure :

Δ ABC ~ Δ ADE ,

AE = 6 cm. , EB = 8 cm. , AD = 7 cm.

Find : The length of $\overline{DC}$ and the ratio $\frac{DE}{BC}$



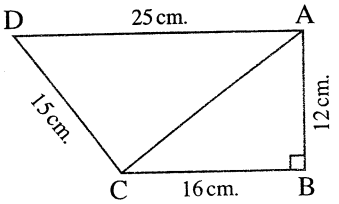
4 [a] In the opposite figure :

AB = 12 cm. , BC = 16 cm. , AD = 25 cm. ,

DC = 15 cm. , m (∠ B) = 90°

Find : The length of $\overline{AC}$

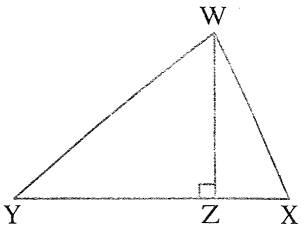
Prove that : ∠ ACD is right.



[b] In the opposite figure :

(1) The projection of $\overline{WX}$ on $\overleftrightarrow{XY}$ is .....

(2) The projection of $\overline{WY}$ on $\overleftrightarrow{XY}$ is .....

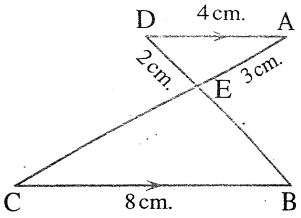


5 **[a] In the opposite figure :**

$\overline{AD}$ // $\overline{BC}$, AE = 3 cm. , DE = 2 cm. ,

AD = 4 cm. , BC = 8 cm.

Prove that : Δ AED ~ Δ CEB , then find the length of $\overline{CE}$



[b] Detrermine the type of Δ ABC according to its angles if AB = 8 cm. , BC = 9 çm. , CA = 7 cm.

Additional question

[a] Choose the correct answer :

(1) If two triangles are equal in area and drawn on the same base , then their vertices are on a straight line .....

(a) perpendicular to the base. (b) bisects the base.

(c) parallel to the base. (d) cuts the base.

(2) The lengths of the two adjacent sides in a parallelogram are 7 cm. , 5 cm. and its smallest height is 4 cm. , then the area of the parallelogram equals ..... cm^2

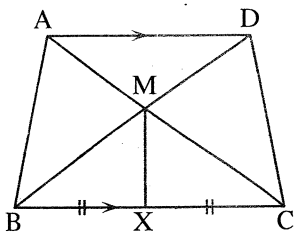
(a) 35 (b) 25 (c) 28 (d) 20

[b] In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, X is the midpoint of $\overline{BC}$

Prove that :

The area of the figure ABXM = the area of the figure DCXM



11 Kafr EL-Sheikh Governorate

Maths Inspection

Answer the following questions :

1 **Choose the correct answer :**

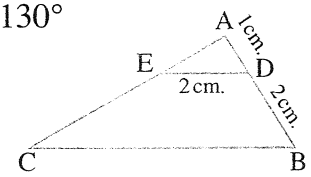
(1) ABC is an obtuse - angled triangle at A in which : AB = 5 cm. , BC = 8 cm. , then AC = ... cm.

(a) 5 (b) 7 (c) 8 (d) 13

(2) ABC is a triangle in which : $(AB)^2 = (AC)^2 + (BC)^2$, m ($\angle$ B) = 40° ,
then m ($\angle$ A) = ...

(a) 40° (b) 50° (c) 90° (d) 130°

(3) **In the opposite figure :**



Δ ADE ~ Δ ABC ,
then the length of $\overline{BC}$ = ... cm.

(a) 3 (b) 4 (c) 6 (d) 8

(4) If the ratio of enlargement between two triangles equales 1 , then the two triangles are .....

(a) congruent. (b) different. (c) right-angled. (d) coincide.

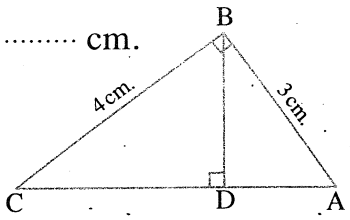
(5) If the ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their perimeters is .....

(a) 2 : 5 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

2 Complete :

In the opposite figure :

m ($\angle$ B) = 90° , $\overline{BD} \perp \overline{AC}$



(1) $(AC)^2$ = ... + ... = ... cm^2 , then AC = ... cm.

(2) The projection of $\overline{AB}$ on $\overleftrightarrow{AC}$ is .....

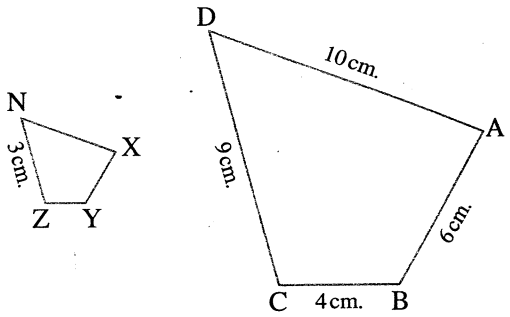
(3) $(BD)^2 = AD \times$ .....

(4) $(BC)^2 = CA \times$ .....

(5) Δ ABC ~ Δ ..... ~ Δ .....

3 [a] In the opposite figure :

The polygon ABCD ~ The polygon XYZN
, AB = 6 cm. , BC = 4 cm. , CD = 9 cm.
, DA = 10 cm. , ZN = 3 cm.



Find :

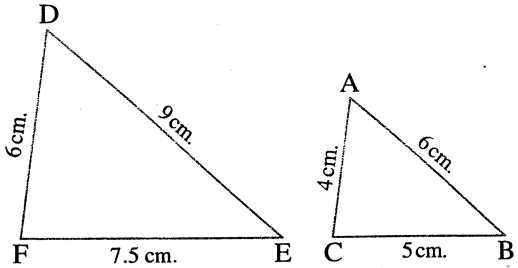
The length of each of $\overline{XY}$, $\overline{YZ}$, $\overline{XN}$

[b] In the opposite figure :

Prove that :

(1) Δ DEF ~ Δ ABC

(2) $\frac{\text{Perimeter of } \Delta \text{ DEF}}{\text{Perimeter of } \Delta \text{ ABC}}$ = the ratio of the similarty

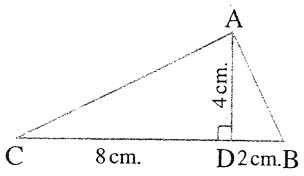


4 [a] **In the opposite figure :**

ABC is a triangle in which : BD = 2 cm.

, CD = 8 cm. , AD = 4 cm. , $\overline{AD} \perp \overline{BC}$

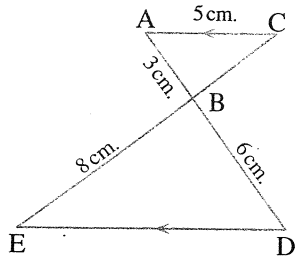
Prove that : m (∠ BAC) = 90°



[b] **In the opposite figure :**

(1) **Prove that :** Δ ABC ~ Δ DBE

(2) **Find :** The length of each of $\overline{BC}$, $\overline{DE}$

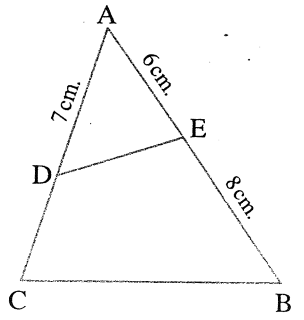


5 **In the opposite figure :**

If Δ ABC ~ Δ ADE , AE = 6 cm.

, AD = 7 cm. , BE = 8 cm.

Find : (1) The length of $\overline{DC}$ (2) $\frac{DE}{BC}$



Additional question

[a] **Complete each of the following :**

(1) A trapezium whose base lengths are 6 cm. , 8 cm. and its height is 5 cm. , then its area = ... cm^2

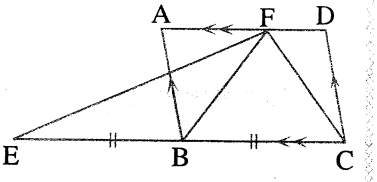
(2) ABCD is parallelogram , E ∈ $\overline{DC}$, if the area of Δ AEB = 25 cm^2 , then the area of parallelogram ABCD = ... cm^2

[b] **In the opposite figure :**

ABCD is a parallelogram

, E ∈ $\overleftrightarrow{BC}$ where BE = BC , F ∈ $\overline{AD}$

Prove that : The area of Δ EFC = the area of ▱ ABCD



12 El-Beheira Governorate

Central Maths Supervision

Answer the following questions :

1 **Complete :**

(1) The two polygons are similar to a third palygon are .....

(2) If $\overline{XY} \perp \overleftrightarrow{AB}$ at the point Y , then the projection of $\overline{XY}$ on $\overleftrightarrow{AB}$ is .....

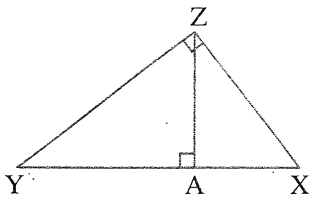
(3) The two triangles are similar if its corresponding side lengths are .....

(4) Δ ABC in which : $(AC)^2 + (BC)^2 = (AB)^2$, m ($\angle$ A) = 65° , then m ($\angle$ B) = ... °

(5) If the ratio of enlargement between two similar triangles equals 1 , then the two triangles are .....

2 Choose the correct answer :

(1) **In the opposite figure :**



$(ZA)^2$ = YA × .....

(a) YX (b) AX

(c) ZY (d) ZX

(2) Δ ABC is an obtuse-angled triangle at B , AB = 3 cm. , BC = 5 cm. , then AC = ... cm.

(a) 8 (b) 7 (c) 15 (d) 4

(3) The length of the projection of a given line segment ..... the length of the original line segment.

(a) ≥ (b) > (c) ≤ (d) <

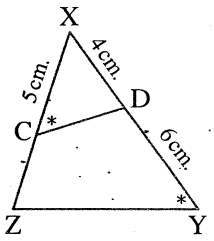
(4) In Δ ABC , if $(AC)^2 - (BC)^2 > (AB)^2$, then $\angle$ A is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

(5) The perpendicular segment drawn from the right angle of the right-angled triangle to the hypotenuse divides it into two ..... triangles.

(a) obtuse-angled (b) acute-angled (c) equilateral (d) similar

3 [a] In the opposite figure :

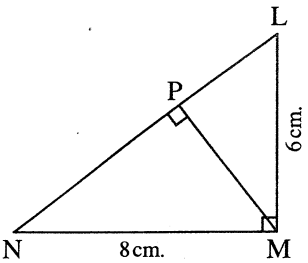


m ($\angle$ XCD) = m ($\angle$ Y) , XD = 4 cm.

, XC = 5 cm. , DY = 6 cm. ,

Prove that : Δ XCD ~ Δ XYZ , then calculate length of $\overline{CZ}$

[b] In the opposite figure :



m ($\angle$ M) = 90° , $\overline{MP} \perp \overline{NL}$

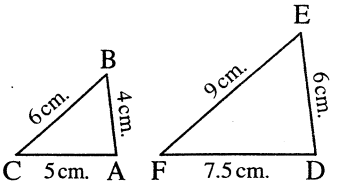
, LM = 6 cm. , MN = 8 cm.

Find : The length of each of $\overline{NP}$ and $\overline{MP}$

4 [a] In Δ XYZ , XY = 7 cm. , YZ = 9 cm. and XZ = 12 cm.

Determine the type of the angle Z

[b] In the opposite figure :



Prove that : (1) Δ ABC ~ Δ DEF

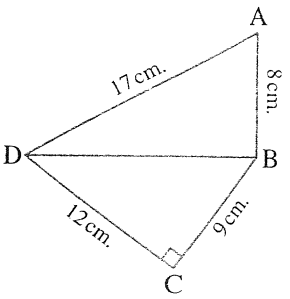
(2) $\frac{\text{perimeter of } \Delta \text{ ABC}}{\text{perimeter of } \Delta \text{ DEF}} = \frac{2}{3}$

5 In the opposite figure :

ABCD is a quadrilateral in which : m (∠ C) = 90° , AB = 8 cm. , BC = 9 cm. , CD = 12 cm. and DA = 17 cm.

(1) **Prove that :** m (∠ ABD) = 90°

(2) **Find :** The projection of $\overline{BD}$ on $\overleftrightarrow{CD}$



Additional question

[a] **Complete each of the following :**

(1) Area of a triangle is equal to half of area of a parallelogram if they have a common .....

(2) The parallelograms with bases equal in length and lying on a straight line , while the opposite sides to these bases are on another straight line are .....

[b] The area of a trapezium is 88 cm^2 , its height is 8 cm. and the length of one of its parallel bases is 10 cm. find the length of the other base.

13 Assiut Governorate

Assiut Educational Zone
Badr Language School

Answer the following questions :

1 Choose the correct answer :

(1) If two polygons are similar and the ratio between the lengths of two corresponding sides is 1 : 3 and the perimeter of smaller polygon is 15 cm. , then the perimeter of the greater polygon is ..... cm.

(a) 30 (b) 45 (c) 60 (d) 75

(2) ABC is a triangle in which : $(AB)^2 > (AC)^2 + (BC)^2$, then ∠ C is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

(3) If the ratio of enlargement between two similar triangles equals ..... , then the two triangle are congruent.

(a) 1 (b) 2 (c) 0.5 (d) 0.25

(4) ABC is a triangle in which : $(AB)^2 = (AC)^2 + (BC)^2$, m (∠ B) = 40° , then m (∠ A) = ...

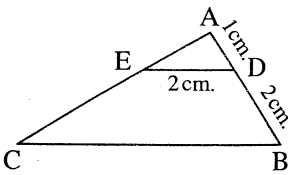
(a) 40° (b) 50° (c) 90° (d) 130°

(5) **In the oposite figure :**

Δ ADE ~ Δ ABC , then the length of $\overline{BC}$ = ... cm.

(a) 3 (b) 4

(c) 6 (d) 8

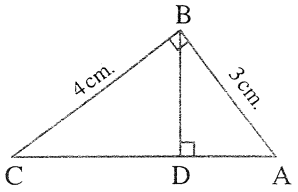


2 [a] **Complete :**

The polygons are similar if the corresponding side lengths are ..... and the corresponding angles are .....

[b] **In the opposite figure :**

ABC is a right-angled triangle at B , $\overline{BD} \perp \overleftrightarrow{AC}$



Complete :

(1) The projection of $\overline{AB}$ on $\overleftrightarrow{AC}$ is .....

(2) $(BD)^2 = AD \times$ .....

(3) $(BC)^2 = CD \times$ .....

(4) The perimeter of Δ BAD : The perimeter of Δ CBD = ... : .....

---

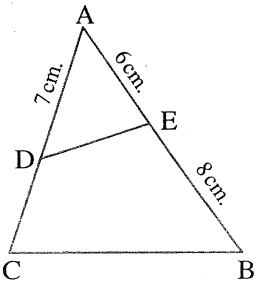
3 [a] **In the opposite figure :**

If $\Delta ABC \sim \Delta ADE$, AE = 6 cm.

, AD = 7 cm. , BE = 8 cm.

Find : (1) The length of $\overline{DC}$

(2) $\frac{DE}{BC}$



[b] In Δ ABC , if AB = 8 cm. , BC = 10 cm. and CA = 7 cm.

What is the type of Δ ABC according to its angles ?

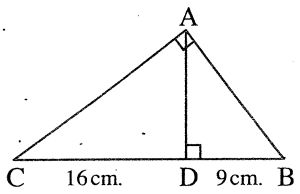
---

4 [a] **In the opposite figure :**

ABC is a right-angled triangle at A ,

$\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm.

Find : The length of each of $\overline{AB}$, $\overline{AC}$, $\overline{AD}$



[b] The side lengths of one of two similar triangles are 3 cm. , 4 cm. and 5 cm. and the perimeter of the other triangle is 36 cm. Find the side lengths of the other triangle.

---

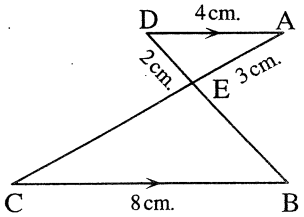
5 [a] **In the opposite figure :**

$\overline{AD} // \overline{BC}$, AD = 4 cm. , BC = 8 cm.

, AE = 3 cm. and ED = 2 cm.

(1) **Prove that :** Δ AED $\sim \Delta$ CED

(2) **Find :** The perimeter of Δ EBC

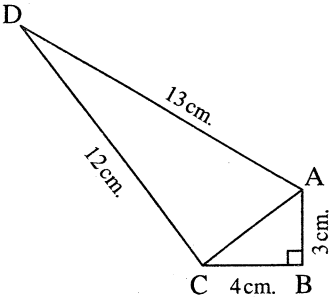


[b] **In the opposite figure :**

AB = 3 cm. , BC = 4 cm. , AD = 13 cm. ,

CD = 12 cm. , m ($\angle$ B) = 90°

Prove that : m ($\angle$ ACD) = 90°



Additional question

[a] Choose the correct answer :

(1) The quadrilateral whose area half square of its diagonal length is .....

(a) parallelogram. (b) rectangle. (c) rhombus. (d) square.

(2) The diagonals of an isosceles trapezium .....

(a) congruent. (b) perpendicular. (c) bisect each other. (d) parallel.

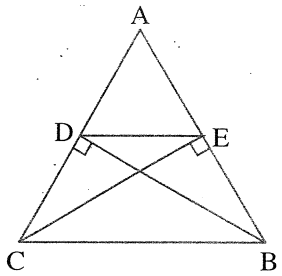
[b] In the opposite figure :

If AB = AC ,

$\overline{BD} \perp \overline{AC}$ and $\overline{CE} \perp \overline{AB}$

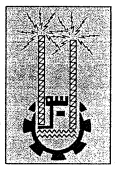
Prove that : (1) $\overline{ED} // \overline{BC}$

(2) The area of Δ ADB = the area of Δ AEC



14 Aswan Governorate

Aswan Educational Directorate
Eng. M.M. Yaqoub L. School



Answer the following questions :

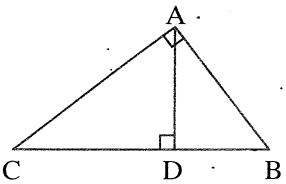
1 Complete each of the following :

(1) The two triangles are similar if their corresponding angles are .....

(2) **In the opposite figure :**

ABC is a right-angled triangle at A

and $\overline{AD} \perp \overline{BC}$, then $(BA)^2 = BD \times$ .....



(3) In a triangle , if the square of the length of a side is equal to the sum of the squares of the lengths of the other two sides , then the angle opposite to this side is a ..... angle.

(4) In a parallelogram each two opposite angles are .....

(5) ABC is a triangle in which : $(BC)^2 = (AB)^2 + (AC)^2$, m (∠ B) = 40°

, then m (∠ C) = ... °

2 Choose the correct answer :

(1) If $\overline{AB} // \overleftrightarrow{XY}$, then the length of the projection of $\overline{AB}$ on $\overleftrightarrow{XY}$ ..... the length of $\overline{AB}$

(a) < (b) > (c) = (d) ≤

(2) Δ ABC is an obtuse-angled triangle at B , AB = 3 cm. and BC = 5 cm. , then AC can be equal ..... cm.

(a) 4 (b) 5 (c) 7 (d) 8

(3) If the ratio between the lengths of two corresponding sides in two similar triangles is equal to ..... , then the two triangles are congruent.

(a) 1 (b) 2 (c) 0.5 (d) 0.25

(4) The number of axis of symmetry of the square = ...

(a) 1 (b) 2 (c) 3 (d) 4

(5) If the measure of the vertex angle of an isosceles triangle is 80° , then the measure of each of its two base angles = ...

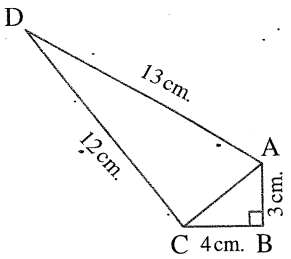
(a) 80° (b) 100° (c) 60° (d) 50°

3 **[a] In the opposite figure :**

AB = 3 cm. , BC = 4 cm. , AD = 13 cm.

CD = 12 cm. , m (∠ B) = 90°

Prove that : m (∠ ACD) = 90°

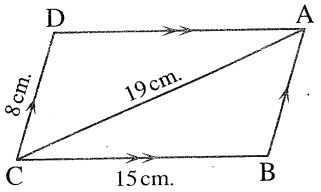


[b] In the opposite figure :

ABCD is a parallelogram in which :

BC = 15 cm. , CD = 8 cm. and AC = 19 cm.

Prove that : ∠ ABC is an obtuse-angled.

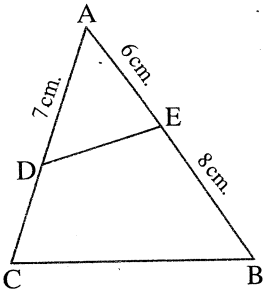


4 **[a] In the opposite figure :**

If Δ ABC ~ Δ ADE , AE = 6 cm. ,

AD = 7 cm. , BE = 8 cm.

Find : (1) The length of $\overline{DC}$ (2) $\frac{DE}{BC}$

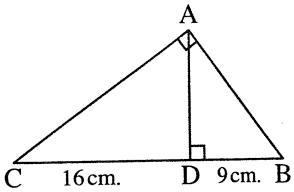


[b] Determine the type of the greatest angle in Δ ABC where AB = 8 cm. , BC = 10 cm. and AC = 7 cm.

5 **In the opposite figure :**

ABC is a right-angled triangle at A ,

$\overline{AD} \perp \overline{BC}$, BD = 9 cm. , CD = 16 cm.



Find : (1) The length of $\overline{AB}$

(2) The length of $\overline{AC}$

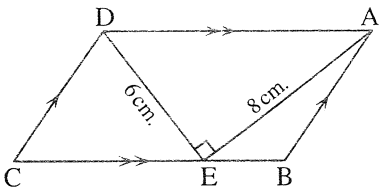
(3) The length of the projection of $\overline{AC}$ on $\overleftrightarrow{AD}$

Additional question

[a] Complete the following :

(1) **In the opposite figure :**

Area of ▱ ABCD = ... cm^2



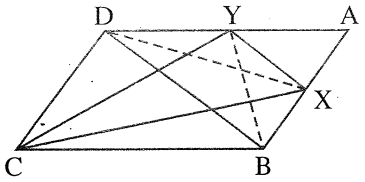
(2) The median of a triangle divides its surface into two triangles ..... in area.

[b] In the opposite figure :

ABCD is a parallelogram , $X \in \overline{AB}$, $Y \in \overline{AD}$

such that : area of Δ CBX = area of Δ CYD

Prove that : $\overline{XY} \parallel \overline{BD}$



15 South Sinai Governorate

Educational Directorate
Tur Sinai Educational Zone

Answer the following questions :

1 Choose the correct answer :

(1) If m (∠ ABC) = 45° , then m (reflex ∠ ABC) = ...

(a) 45° (b) 90° (c) 270° (d) 315°

(2) Two similar polygons , if the ratio between two corresponding side lengths is 3 : 5 , then the ratio between their perimeters is .....

(a) 5 : 2 (b) 5 : 3 (c) 3 : 5 (d) 1 : 2

(3) In the triangle ABC , if $(AB)^2 > (BC)^2 + (AC)^2$, then ∠ C is .....

(a) obtuse angle. (b) straight angle. (c) right angle. (d) acute angle.

(4) If ∠ A complements ∠ B and ∠ B supplements ∠ C and m (∠ A) = 30° then m (∠ C) = ...

(a) 150° (b) 120° (c) 60° (d) 30°

(5) The two triangles are congruent if the ratio of magnification = ...

(a) 0.25 (b) 0.5 (c) 0.75 (d) 1

2 Complete the following :

(1) The type of the triangle whose side lengths are 6 cm. , 8 cm. and 10 cm. is ..... -angled triangle.

(2) The two triangles are similar if the corresponding angles are ..... in measure.

(3) The length of the projection of a line segment on a given straight line ..... the length of the original line segment.

(4) The number of the diagonals of the quadrilateral is .....

(5) In ΔABC , if $(AC)^2 = (AB)^2 + (BC)^2$, then m ($\angle$ .....) = $90°$

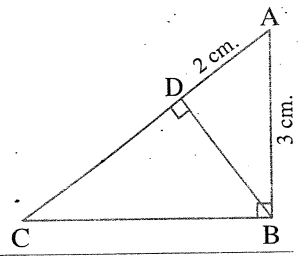
3 [a] Determine the type of the greatest angle of the triangle ABC where AB = 8 cm. , BC = 10 cm. , AC = 7 cm. What is the type of the triangle according to measures of its angles ?

[b] In the opposite figure :

ABC is a right-angled triangle at B ,

AB = 3 cm. , AD = 2 cm. , $\overline{BD} \perp \overline{AC}$

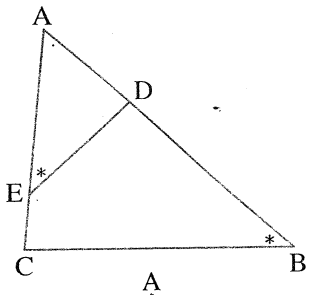
Find : the length of $\overline{DC}$



4 [a] **In the opposite figure :**

m ($\angle$ AED) = m ($\angle$ B)

Prove that : $\Delta ADE \sim \Delta ACB$



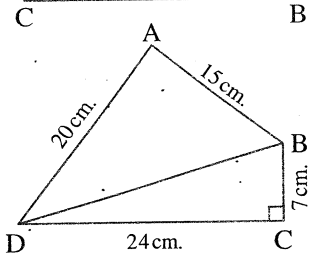
[b] In the opposite figure :

m ($\angle$ C) = $90°$, AB = 15 cm. , BC = 7 cm. ,

CD = 24 cm. , AD = 20 cm.

(1) **Find :** The length of $\overline{BD}$

(2) **Prove that :** m ($\angle$ A) = $90°$



5 [a] **In the opposite figure :**

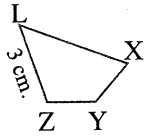
The polygon ABCD ~ The polygon XYZL ,

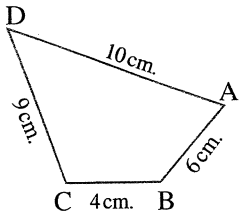
AB = 6 cm. , BC = 4 cm. ,

CD = 9 cm. , DA = 10 cm. ,

ZL = 3 cm.

Find : The perimeter of the polygon XYZL





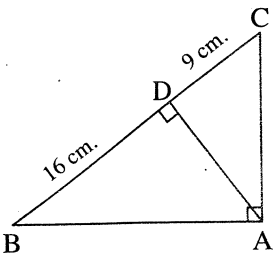
[b] In the opposite figure :

ABC is a right-angled triangle at A ,

$\overline{AD} \perp \overline{BC}$, BD = 16 cm. ,

DC = 9 cm.

Find : The length of each of $\overline{AB}$ and $\overline{AD}$



Additional question

[a] Choose the correct answer :

(1) The ratio between the area of the parallelogram and the area of the triangle whose base is common and are included between two parallel straight lines = ...

(a) 1 : 2 (b) 1 : 3 (c) 4 : 2 (d) 2 : 3

(2) If ABCD is a parallelogram in which : AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its greater height = ...

(a) 2 cm. (b) 4 cm. (c) 8 cm. (d) 10 cm.

[b] In the opposite figure :

$\overline{AD}$ is a median of Δ ABC ,

E is the midpoint of $\overline{AD}$

Prove that : Area of Δ EBC = $\frac{1}{2}$ area of Δ ABC